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September 25, 1995, Vol. 29, No. 39, 220 Pages, $6/Copy, $48/Year

COMPUTERWORLD

Cabletron fills void in switching line

By Bob Wallace

Cabletron Systems, Inc. this week will announce a series of products designed to fill a glaring and often exploited gap in its vaunted switching hub line, *Computerworld* has learned.

The SmartSwitch product family, which will be formally unveiled at the Networld/Interop '95 conference in Atlanta, will comprise a new switching hub and high-speed switching modules for Cabletron's midrange and top-end switching hubs.

Networld/ Interop '95

The SmartSwitch switching hub will fill the gap between Cabletron's widely used midsize MultiMedia Access Center hub and the vendor's top-of-the-line MMAC-Plus switching hub.

The new switching modules will raise to 750,000 packet/sec. the horsepower of the MMAC (50,000 packet/sec.) and the MMAC-Plus (150,000 packet/sec.). The standalone SmartSwitch hub will also run at 750,000 packet/sec.

The switch and other SmartSwitch products will sport the newly developed application specific integrated circuit (see chart, page 12).

A need for speed

One longtime Cabletron user expressed interest in the SmartSwitch products.

"It sounds like they're coming out with truly fast and versatile switching options, which is great for us because we use their switching hubs as the base for a 160-building network," said James Wiedel, director of networking at the University of Southern California in Los Angeles. "The modules will be very useful for us because we need the speed."

Analysts briefed by Cabletron on the product blueprint said rivals have been making the most of

Cabletron, *page 12*

AT&T splinters

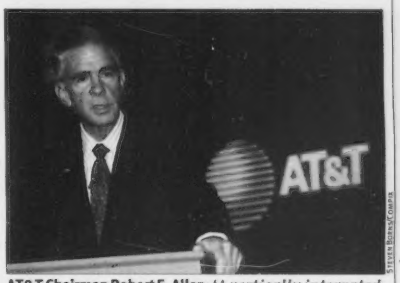
Users may gain added services but lose one-stop shopping

By Neal Weinberg

AT&T Corp.'s unexpected and unprecedented decision last week to split itself into three independent companies will mean new products — but it will also complicate life for telecommunications managers.

Corporate telecom and information systems managers anticipate a surge of new products and services once the breakup is complete.

But users accustomed to one-stop shopping will have to deal with double and triple the number of sales representatives when they try to load their cart with telecommunications and computer products.



AT&T Chairman Robert E. Allen: *'A vertically integrated structure is an idea whose time may have passed in this industry'*

The good and the bad

"The bad thing is that I'll have to deal with more people. The good thing is that there will be more services," said John P. Viher, manager of communications services at Bridgestone/Firestone, Inc. in Akron, Ohio.

Overall, the breakup is expected to lead to more spirited competition, innovative products and lower prices. But it will also mean more complex purchasing decisions for users.

Driving those changes was AT&T's decision to abandon its grand design to merge communications and computers into a vertically integrated monolith. Instead, AT&T will split up into a communications services company carrying the AT&T name, a network products company to be named later and the money-losing AT&T Global Information Solutions com-

AT&T, *page 14*

Novell drops Unix, blindsides users

By Jean S. Bozman
NEW YORK

UNIX EXPO THE OPEN SYSTEMS SHOW

Users and analysts walking the halls of Unix Expo '95 here last week struggled to understand the staggering impact of Novell, Inc.'s decision to throw in the towel on the Unix System V operating system.

Just two years after Novell executives chortled about acquiring the classic Unix System V source code and using it to unify the fractured Unix market, the network vendor essentially outsourced the task of future Unix development to SCO, Inc. and Hewlett-Packard Co. (see story, page 161).

Beyond the initial shock of hearing that three well-known Unix versions would be boiled down into one by 1997, users said the migration

Novell, *page 161*

Netscape flaw poses small cyberthreat

By Kim S. Nash and Gary H. Anthes

A serious encryption flaw uncovered two weeks ago in Netscape Communications Corp.'s Internet browser — the second security mishap for Netscape in two months — prompted tales of doom last week that could chill a budding electronic commerce market, users and analysts said.

Yet the cybercommunity was unwilling to judge Netscape harshly. The notion that any software can be bulletproof is naive, many observers noted.

Netscape's most recent problem, which was discovered by two graduate students at the University of California, was related to the relatively simple method Net-

Netscape, *page 16*

Newspaper

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SAP offers customization to simplify R/3 installs

By Julia King

Marshall Field built a retail empire by giving the lady what she wants.

Enterprise software phenomenon SAP AG is taking that a step further, pledging to give thousands of R/3 customers exactly what each of them wants — and not a feature or function more until a company specifically requires it.

SAP will accomplish this via its new just-in-time functionality strategy, announced last week at its annual user conference in Phoenix. The company's aim is to simplify and shorten the process of getting its notoriously complex R/3 software up and running.

"We must get it that you can run an [R/3] project with normal people, not all doctors and professors," said Hasso Plattner, SAP's vice chairman.

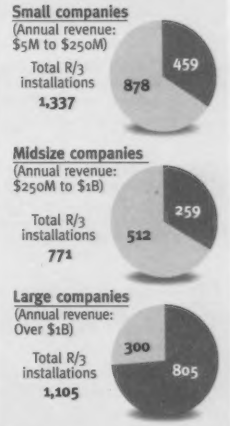
Plattner said SAP will begin selling the customized versions of its

SAP, *page 15*

Reality check

While many R/3 systems are installed, not all are up and running

■ Operational R/3 systems



A PUBLICATION OF IDG

Inside Computerworld

Sept. 25, 1995

News

4 Database administration
IBM plans to test a version of its DataHub software that provides a single point of control for multiple Unix databases plus mainframe DB2.

4 Missing the mark
Intel's P6 falls short of expectations.

6 Oracle user group
While Oracle's Internet wares have stolen the spotlight, the vendor makes sure to emphasize speed and other enhancements in its bread-and-butter database at its user group conference.

8 Chipping away
A design flaw that seriously affected the applicability of the PowerPC 604 in SMP servers is resolved — but servers based on the chip won't arrive until some time in the future.

10 CA-Unicenter
Computer Associates plans to integrate storage management as well as change and configuration management into CA-Unicenter.

12 Client/server team
Apple, IBM and Sun are teaming up to provide smart agents for client/server network and systems management.

16 Netscape nets Collabra
Netscape decides to buy Collabra Software, but users will not see integration until next year.

COMPUTER INDUSTRY

32 Tech war
Silicon Valley battle over encryption technology escalates.

OPINION

34 Back to the future
Bill Laberis explains AT&T's restructuring. Hint: It has nothing to do with "computers" and everything to do with "communications."

35 Info highway
Chris Miksanek comes up with some replacements for the tired old cliches about the information superhighway.

35 Save the FCC
Edward Warner argues that the Federal Communications Commission is really the network manager's ally and should be spared the ax.

118 Simple can be stupid
Richard Koeller says simple answers can make lousy solutions when users and IS disagree.

Techno Brahmins: *Hale and Dorr is a downtown Boston law firm,* **but these lawyers speak cyber.** *The firm has a ravenous appetite for new technology.* **Enterprise Networking, page 73**



MARK ALCAREZ

Choice Cuts

NEW

HOT HAPPENINGS

Pull out your planner! *Our editors pick the gotta-get-to IS events for you and your staff. Check out this clip-and-save section.* **Management, page 117**

Everyone is talking about it, **but few are doing ATM. CW Guide, page 123.** *Your phone company will offer ATM soon.* **Marketplace, page 152**

Is your company interested in deploying an ATM WAN?
YES
74%

If yes, what stage are you in?
Just thinking
81%

Source: Forrester Research, Inc.

Technical Sections

DESKTOP COMPUTING

39 Win 95 graphics
Windows 95 graphics software may take a bite out of the Macintosh's installed base.

41 Zenith PowerPC boxes
Zenith Data makes a foray into the PowerPC world with a new line of workstations and enterprise servers.

WORKGROUP COMPUTING

53 Faster SCSI
Vendors of peripherals and computer systems that communicate via the standard SCSI interface are scrambling to extend the standard even further.

57 Apple networking
Apple's Open Transport networking architecture is a huge step in the right direction for a company that once treated networking like an afterthought.

ENTERPRISE NETWORKING

73 Fast Ethernet
Fast Ethernet technology is at a crossroads and seems to be headed nowhere fast as a desktop technology.

76 The Internet Page
Hyperlinking, trade shows and making the 'net multilingual.

LARGE SYSTEMS

99 Snap-together apps
Enterprise client/server software vendors prepare mix-and-match applications that snap together using the Open Applications Group's integration specification.

104 SMP in Texas
Houston Lighting & Power has recently finished converting from a mainframe to a Sequent SMP cluster.

APPLICATION DEVELOPMENT

109 Visual Basic partners
Microsoft may have a lot to learn about enterprise-scale development, but it's getting help. Among nearly 100 vendors announcing products for Visual Basic 4.0 are Texas Instruments and Digital.

Features

MANAGEMENT

112 When GUIs and cultures collide
Avoiding international incidents with global interface designs means knowing cultural pitfalls and taboos.

117 Hot Happenings

IN DEPTH

134 Soundoff!
Should IS lead re-engineering efforts?

CAREERS

139 Second chance
Looking to learn new skills? Two groups offer internships to displaced IS professionals.

Etc.

Company Index ____ 158
Editorial/Letters ____ 34, 36
Inside Lines ____ 162
Sept. 22 Stock Ticker ____ 159
How to contact CW ____ 158



JAMES KRAUS

Our Sept. 11 comparison of Windows 95 and OS/2 — as well as our subsequent Usenet and CompuServe postings about that review — has drawn considerable reaction from readers. See page 36 for a sampling of letters about the review and **Computerworld's** *response.*

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"Best Ease Of Use"
"Best Documentation"
"Best Partner"

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*January 1995**

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**CIO Magazine* 1994 Readers' Choice Awards.

IBM seeks to take control of database administration

Upcoming software will manage mainframe, Unix databases

By Craig Stedman

By year's end, IBM will start field-testing software that provides a single point of control for administering multiple Unix databases plus mainframe DB2.

By doing so, IBM hopes to bolster its belated attempt to crack the open systems database market, where it has had a relatively minor presence.

The upcoming product merges separate Unix and OS/2 versions of IBM's DataHub software, which lets administrators monitor and manage distributed databases from a central site. The combined DataHub uses the Unix variant as its base technology. General availability is planned for the first half of next year.

DataHub for Unix, which shipped in late August, manages Unix databases from IBM, Oracle Corp. and Sybase, Inc. The older DataHub for OS/2 is limited to IBM's DB2 family. The packages also have separate code bases and user interfaces, forcing users to learn two products.

The new DataHub standardizes all that, IBM confirmed. It will run on both Unix and OS/2 platforms and be able to administer most versions of DB2 as well as Oracle, Sybase and probably other Unix databases, said Jeff Jones, brand manager for database systems management at IBM (see chart).

While some analysts already view DataHub for Unix as the most advanced tool on the market for remotely administering databases, potential customers said the expanded database support and reduced training promised by the merged version should make it much more attractive.

"In our shop, we have almost every single DB2 product plus third-party databases," such as Oracle and Sybase, said Marco Chou, a database systems consultant at Allstate Insurance Co. in Northbrook, Ill. "Each one has to be managed individually now. It would be more beneficial to have a single point where you could manage multiple" databases.

Allstate tested DataHub for Unix but hasn't yet bought it. The product is "kind of a first cut" and lacks support for automatically making changes to multiple databases, Chou said. But the combined DataHub could help customers "reduce some unnecessary resources," he added. "Fewer administrators could manage more databases."

Centralizing database administration on a single platform "is the direction we want to go in," said C. F. Wong, a database administrator and object specialist at Bank of Montreal's computing facility in Toronto. "That would cut down on all the learning curve and training issues."

Checking it out

Bank of Montreal is looking at buying DataHub to manage DB2 databases residing on its MVS mainframes and OS/2 servers, Wong said. The bank hasn't yet started using Unix databases, but it may use that technology in future applications such as data warehousing, he added.

With DataHub for Unix, IBM was the first Unix database vendor to support administration of outside databases. IBM also is ahead of Oracle, Sybase and other database tools developers in providing so-called "watchdog" agents that monitor databases for problems, according to analysts.

But having a single user interface for DB2 for MVS and Unix databases is an important enhancement, said David McGoveran, president of Alternative Technologies, a database consultancy in Boulder Creek, Calif. DataHub for Unix is also "still too IBM-centric," he added. "I think the new release is going to solve a lot of those problems."

HUBBA HUBBA

The merged version of IBM's DataHub software will support the following databases and host operating systems:

DATABASES
- DB2 for MVS, AIX and OS/2
- Oracle
- Sybase
- Informix*
- CA-Ingres*
- DB2 for OS/400*

HOST SYSTEMS
- AIX
- HP-UX
- Sun Solaris
- OS/2

*Potential

Corrections

Due to a reporting error, Thomas Loane, vice president of computers and communications services at Alamo Rent A Car, Inc., was misquoted in "StorageTek Kodiak array sends a chill" [CW, Sept. 11]. Loane said Storage Technology Corp.'s Iceberg doesn't perform well in some sequential processing tasks such as data sorts, but he didn't mean the array is ill-suited for batch jobs.

*****

In "County's IS takes its applications to market" [CW, Sept. 4], the price of Linx, a client/server-based legal case management system developed by Pierce County's information systems department in Tacoma, Wash., was incorrect. The correct cost is $1 million.

*****

Due to an editing error, "Win 95, NT compatibility awaits '96 reality check" [CW, Sept. 4], incorrectly said users and developers "hoping to run the same application" under Microsoft Corp.'s Windows NT and Windows 95 will have to wait until next year. The correct information is that an identical look and feel won't exist until next year. According to Microsoft, users have been able to run most applications under Windows 95 and Windows NT since the first beta release, although the graphical user interfaces aren't identical.

Intel's P6 chip falls short of expectations

By Jaikumar Vijayan

Intel Corp.'s next-generation P6 chip won't offer a significant performance boost for most of today's mainstream PC applications, including those running under Windows 95.

That is because Intel, which has spent four years designing and optimizing the chip for a 32-bit environment, overestimated both the extent to which Microsoft Corp.'s Windows 95 would be built on a 32-bit foundation and the number of 32-bit applications that would be available by the time the operating system was released. Windows 95 contains more 16-bit code than Intel expected.

As a result, the P6 — newly christened the Pentium Pro — gets seriously bogged down in 16-bit environments, according to industry observers. Even applications running under the 32-bit Windows 95 get slowed down because the operating system contains enough chunks of 16-bit code to degrade the processor's performance by up to 20%, analysts said.

Further, this means that the chip, which was expected to ship widely in the mass volume PC market by the second half of next year, now isn't expected to do so until well into 1997, analysts said.

Stick with Pentiums

The bottom line is that users contemplating running the Pentium Pro for current 16-bit applications and/or under Windows 95 may be better off staying with Pentium-based systems for now, said Linley Gwennap, editor of "The Microprocessor Report," an industry newsletter in Sebastopol, Calif.

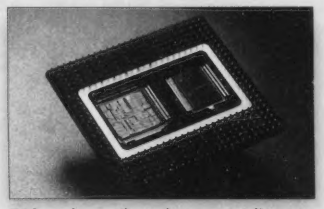
"It doesn't make sense to buy the Pentium Pro if you are running 32-bit under Windows 95 because the performance is about the same as a Pentium with the same clock speed," Gwennap said.

In fact, early tests of systems based on the Pentium Pro indicate that the chip may actually be slower than current Pentiums when running some 16-bit applications, although it is impressive under Windows NT, analysts said.

For some users, that isn't good enough.

"I wouldn't have a use for it. I don't have anybody here that runs solely 32-bit apps," said John Williams, MIS manager at Priority Pharmacy in San Diego.

"The Pentium Pro is not something that we are champing at the bit to get at right now, but I was surprised to hear that the chip is not much faster than the current generation of processors," said Glen Jurmann, section manager at Baxter Healthcare Corp. in Chicago.



P6 is no longer the code name. Intel's next-generation processor is officially called the Pentium Pro.

- **To be released:** Fourth quarter
- **Initial clock speeds:** 133 MHz, 150 MHz and 166 MHz
- **Number of transistors:** 5.5 million
- **Aimed at:** High-end workstations, servers and eventually desktop PCs

Meanwhile, Intel last week defended the processor's performance in 16-bit environments, saying that the server and high-end desktop segments were always the targeted markets.

"This was not designed as a great performance boost for today's software.... It's here for tomorrow's software," said Carl Everett, a vice president at Intel. "It will grow at the rate that 32-bit environments and applications grow."

Intel could accelerate the growth of the chip in mainstream Windows 95 applications simply by cranking up Pentium Pro's clock speed significantly enough to overcome any other shortcomings of the chip.

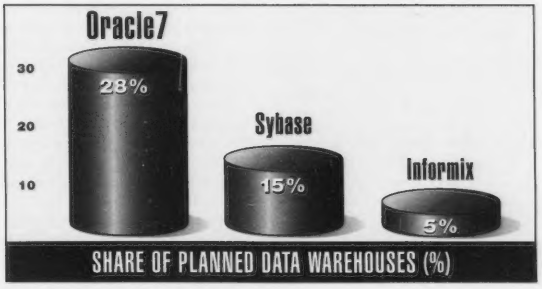
In fact, Intel — which was expected to launch the Pentium Pro with a 133-MHz version — is now expected to start with a 150-MHz version and rapidly keep pushing up clock speeds through next year.

"I believe that Intel will take P6 to 266 MHz or more in the second half of 1996," said Martin Reynolds, an analyst at Dataquest, Inc. in Santa Clara, Calif. In fact, some analysts say they believe a 300-MHz version will be announced by the end of next year.

Before You Look Into A Warehouse, Check This Inventory

Data warehouses are central information repositories for storing and analyzing vast amounts of historical and reference data from a number of different sources, enabling users to gain insights into corporate performance and customer behavior that cannot be gained using disconnected operational systems. Oracle7 has more production features for data warehousing than any other DBMS available, bringing very large database capacity, fast query execution and the management of any data type to the open systems data warehouse.

DATABASE COMPARISON			
	ORACLE7	Sybase System 10	Informix 7.1
Terabyte Databases Supported	Lots	Never	None
Scalable SMP Support	Yes	Never	Yes
Scalable MPP Support	Yes	Never	No
Parallel Query	Yes	Never	Yes
Parallel Load	Yes	Never	No
Parallel Index	Yes	Never	Yes
Parallel Summarization	Yes	Never	Yes
Parallel User-defined Functions	Yes	Never	No
Star Query Optimization	Yes	Never	No
Integrated Replication	Yes	Yes	No
OLAP Integration	Yes	Never	No
In Memory DB (64-bit)	Yes	Never	No
Integrated Text/Video	Yes	Never	No
Spatial Data Integration	Yes	Never	No
READY FOR YOUR WAREHOUSE?	YES	NEVER	NO



META GROUP *ADS Data Warehousing Survey* 1995.

According to Meta Group, Oracle7 is chosen by users nearly twice as often as Sybase and five times as often as Informix for data warehousing applications. If enabling employees to make fast, accurate decisions is important to your company's performance, call Oracle at 1-800-633-1071, Ext. 8197. Or download videos of our customers explaining the competitive advantage they get from the Oracle Warehouse solution at http://www.oracle.com/info/dw/video.html.

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Oracle7.3 focuses on data warehousing

By Dan Richman
PHILADELPHIA

While generating considerable hoopla over its Internet products and other offerings at the International Oracle Users' Week conference here, Oracle Corp. last week highlighted improvements in performance, administration and connectivity for its bread-and-butter relational database.

Following a trend throughout the database industry, the latest version of Oracle emphasizes getting data out of a database, or warehousing, rather than putting it in, which is referred to as on-line transaction processing.

"There's no way to overstate how important warehousing is to us. Any improvements Oracle makes will be welcome," said a user from a large East Coast insurance company who requested anonymity.

Oracle7.3 features

- Four new or improved querying techniques.
- Enhanced query optimizer.
- Enterprise Manager administrative tool.
- Oracle access from mainframes and AS/400s.

Version 7.3 of the Oracle relational database management system went into beta testing at a handful of sites Sept. 19 and is set to ship by March 31. The new version contains improvements that "aren't flashy but are so important that I think we should be calling this Version 8.0," said Gerald Held, a senior vice president at the Redwood Shores, Calif., company.

Hears users' cries

Version 7.3 addresses concerns that users have long called critical.

"Though this is a 'dot' release, there are a ton of things that are exciting in it," said beta user Tammy Lowe, assistant MIS director at Burlington Coat Factory Warehouse Corp. in Burlington, N.J. Lowe praised the increased retrieval speed in Oracle 7.3, which offers four techniques for retrieving data: bit-mapped indexing, adaptively parallel querying, star queries and parallel hash joins.

Bit-mapped indexing is new to Oracle in Version 7.3. The other querying techniques were already present but are expanded in Version 7.3. An enhanced optimizer will ensure that the most effective technique is used, according to Oracle officials.

"Every one of these querying improvements will help us handle the increasing number of data types and the growing complexity of queries we're trying to deal with," Lowe said.

Various competitors offer one or more of the querying techniques, but none seems to offer all of them. No one technique is correct for every situation, users noted, so having the ability to choose among them is essential.

To a packed auditorium, Oracle officials demonstrated Version 7.3's querying powers on a 4T-byte database housed on an eight-processor HP 9000. A query using bit-mapped indexing against 1T-byte of data, for example, produced in five seconds what the same query without it took a minute and 45 seconds to generate.

Oracle also previewed an overarching administrative product that it said will ease the difficulties of managing a relational database system.

The product, Enterprise Manager, heretofore known as Mission Control, is due about the same time as Version 7.3 and will be included for free. Enterprise Manager is completely graphical and will reportedly eliminate the need for SQL. It also displays users and their privileges, monitors performance and performs time-delayed administrative functions for all databases at a site. A scaled-down version, originally called Battlestar and now dubbed Workgroup Manager, will be bundled free with Workgroup Server.

Users find data warehousing easier when vendors talk to one another. See page 109

Up next? The Internet

Not content to lead in relational database market share alone, Oracle is mounting a drive to expand sales in Internet software.

"We have to be *the* provider for the Internet," Oracle Chairman Larry Ellison told customers last week at the International Oracle Users meeting in Philadelphia.

Oracle's Internet-related software offerings will go under the name WebSystem, said Marc R. Benioff, senior vice president of Oracle's Web/workgroup systems division, during a sneak preview.

That product family will include a browser called WebStation and an Internet server, WebServer.

WebStation will include features not found in the market-leading browser from NetScape Communications Corp., Benioff said. Its proprietary scripting language Database Markup Language will give applications some intelligence.

WebStation will run under Microsoft Corp.'s Windows 95 and Windows NT, Mac OS and the Open Software Foundation's Motif and will be free of charge. It will enter beta testing in October and ship by year's end, Benioff said.

WebServer is a Hypertext Transport Protocol server that runs under Windows NT. It can provide video samples using Oracle's newly announced Video Server. WebServer will go into beta testing by year's end and is tentatively scheduled for release early next year. Pricing hasn't been finalized, but Ellison said it might be about $5,000. — *Dan Richman*

Mercury to let users slice, dice data at desktop

By Frank Hayes

Business Objects, Inc. this week will unveil its plans to push the ability to analyze data all the way from the data center to the desktop.

The Cupertino, Calif., company's next-generation database query and reporting tool won't hit the streets until the first quarter of next year. But when it does, the tool — code-named Mercury — will let end users use a mouse to manipulate and analyze enterprise data stored in relational tables, according to users who have seen it demonstrated.

Translation? Triple sales

Sales of "managed query environments," in which the system translates business terms to data requests so users don't have to write their own SQL queries, will rise to $275 million next year. That's more than triple sales of $86 million in 1994, according to Meta Group, Inc.

Existing versions of BusinessObjects let users create reports by referring to information in business terms, rather than forcing them to understand database structures, said Judy O'Connor, technology vice president at T. Rowe Price Associates in Baltimore.

With the new version, "you can associate the way you want that information presented as well," she noted. "That will give us a lot of flexibility we didn't have in the past."

Most current systems that give users this much control over data analysis require either a proprietary, multidimensional database or specialized translation layers that convert relational database schema into business-oriented data characteristics. Mercury sidesteps that problem by creating miniature multidimensional databases on the fly from data stored permanently in Oracle, Sybase, Informix, Teradata or mainframe DB2 databases.

Once users have manipulated the data to their satisfaction, Mercury will let them share their data templates with other users. Mercury will also include an administrative tool for controlling access permissions and managing data distribution.

But whether such a flexible data analysis tool will finally push all report creation out of the data center and down to the desktop may depend on whether users can handle it, said Kumar Kannankutty, project manager at Medtronic, Inc. in Minneapolis.

Name that data type

MULTIDIMENSIONAL DATA
Data that can be identified by several characteristics. For example, sales data might be sorted separately by dimension, such as product, customer, geographic region or sales volume.

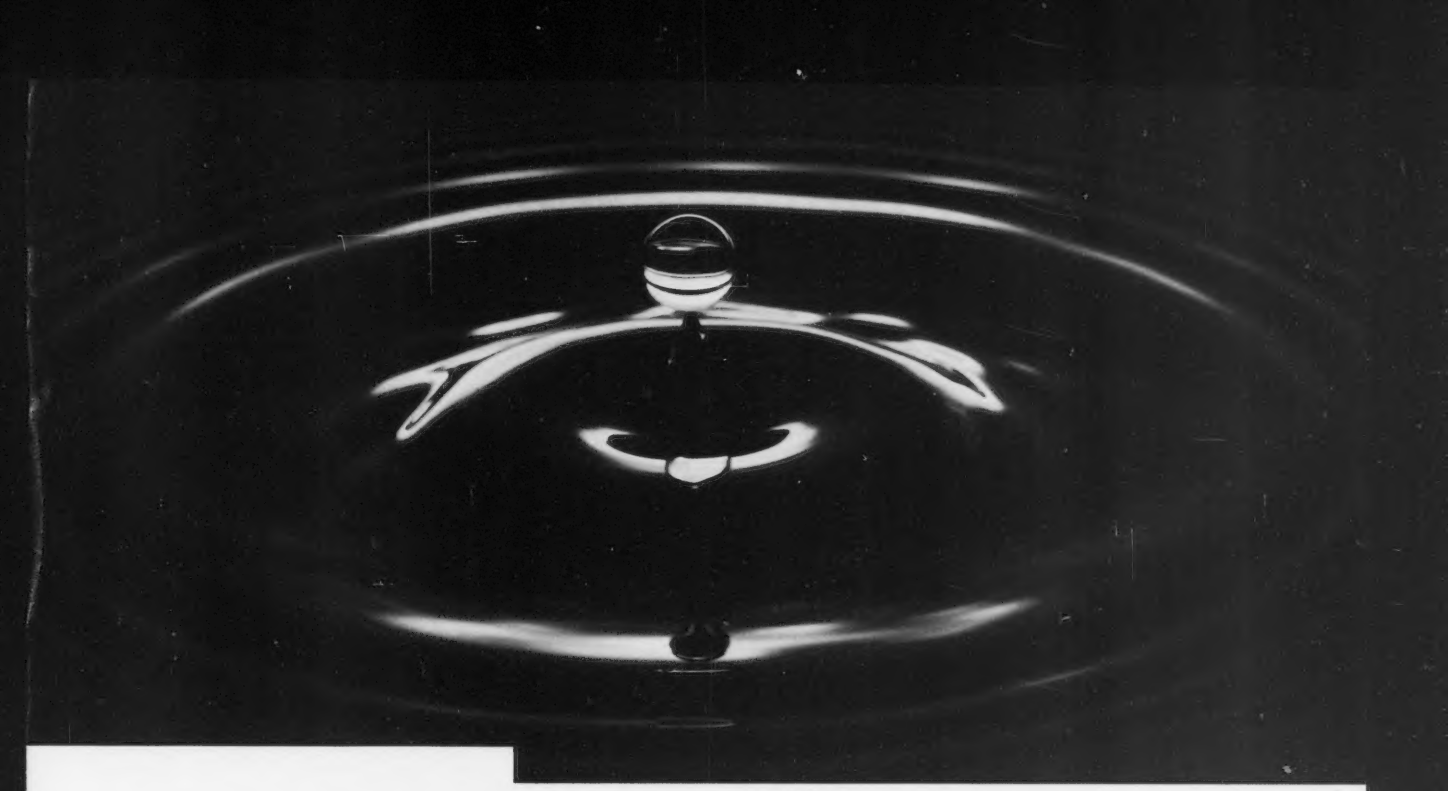
SLICE AND DICE
To change the dimensions by which you look at data. For example, you might look first at customers of a particular product by geographic region, then switch to sales volume in each region by product.

DRILL DOWN
To subdivide data that initially appears as a single dimension. For example, drilling down into total sales might first yield sales by product, then by product in each region.

Mercury's "ability to slice and dice and drill down into data is very good from what I've seen, but it may be overwhelming for a large percentage of users," he said. "Our users have a hard enough time creating a two-level, cross-tab report."

Another potential problem is keeping the links between business terms and database columns updated — a task that will still fall to database administrators, Kannankutty said. At Medtronic, where users could insert their own tables and update data, "keeping the [links] up-to-date becomes a full-time maintenance chore. If it's just as hard as writing reports, you're just transferring the effort from one thing to another," he said.

Mercury, which will begin beta-testing by the end of the year, will run on the same PC, Macintosh and Unix workstations as the existing version of BusinessObjects it is intended to replace. The company wouldn't comment last week on whether the new release will cost more or less than $595, the price of the current version.



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Chip flaw delays servers

Glitch causes six-month wait for SMP systems based on PowerPC 604

By Lisa Picarille and Jaikumar Vijayan

Although officials at Motorola, Inc. claim they have corrected a design flaw that limits the multiprocessing capabilities of the PowerPC 604 chip, which is shipping now, users will not see symmetrical multiprocessing (SMP) systems based on the processor until 1996 — six months later than expected.

The design flaw was a cache coherency problem; the PowerPC 604 chip did not consistently store and update revised data across multiple processors. This meant if one processor accessed and changed data, those changes would not appear if another processor accessed the same data.

According to Phil Pompa, director of marketing at Motorola's RISC Microprocessor Division in Austin, Texas, the design flaw was fixed in a 604 revision that was made available last month. He claimed the chip can now support four-way processing.

"In the early revisions of the product, probably early this year, it was a uniprocessor-only device. SMP was not functional," Pompa acknowledged.

Hurry up and wait

However, several sources at companies that are developing SMP servers based on the 604 chip said the problem will not be fully rectified until October, when a new version is cast.

Those delays will mean it will still take some time for SMP servers to start shipping widely. "It can take months [for systems makers] to finish the integration steps," Pompa said. "The design group can't just pick up the chip and slap it into a machine."

Apple Computer, Inc., one of the largest PowerPC systems makers, has already pushed back the release of its four-way 604 multiprocessor code-named Shriner, according to sources close to Apple.

The PowerPC 604 chip:

- **Is aimed at power users and business workstations**
- **Offers symmetrical multiprocessing**
- **Is available at 100 MHz, 120 MHz and 133 MHz**

Vendors with announced 604-based systems	
Apple Computer	Power Macintosh 9500, 8500 series
Cannon Computer Systems	PowerWorkstation*
DayStar Digital	Genesis family*
FirePower Systems	Powerized MX*
IBM	PowerSeries 800
IPC Technologies	PowerPlay 2*
Motorola	PowerStack family
Zenith Data Systems	ZPower and Escala series*

*Includes both single- and multiprocessor systems

Other PowerPC vendors, including Tatung Science and Technology, Inc. and FirePower Systems, Inc., have demonstrated servers based on the chip as far back as Comdex/Fall '94 but have yet to start shipping them in volume.

Still others have decided to forgo using the 604. Zenith Data Systems has decided not to use the 604 in any of its servers until the next revision of the chip, according to John O'Keefe, the company's executive vice president of the server division. For the moment, Zenith Data has decided to use 100-MHz 601 processors on its Escala servers, which are capable of scaling up to eight processors.

Jim Garden, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H., said that in the meantime, some systems makers may be working around the SMP problems by running the chips in a crippled mode.

Other said they had few problems.

"We have a stable successful operating multiprocessing system based on the 604," said Glen Miranker, vice president of engineering at FirePower in Menlo Park, Calif.

XcelleNet, Shiva team on APIs

By Tim Ouellette

Mobile computer users will now have one point of access to corporate LANs and remote transaction-based applications such as order processing.

In a deal announced last week, XcelleNet, Inc. and Shiva Corp. agreed to jointly develop application programming interfaces (API) between their products. Shiva makes the market-leading LanRover remote LAN access servers; XcelleNet makes RemoteWare software.

RemoteWare lets wireless or remote users connect to a RemoteWare server on the corporate LAN, download information and then do transaction-based processing off-line. This reduces the amount of time users are connected to the network, thus saving on access charges.

The APIs will prove helpful to remote users who want to update sales team members or check inventories, for example.

A spokesman for Atlanta-based XcelleNet said the companies will provide API integration this fall that corporate customers can use to develop a custom client application that can access both Shiva and XcelleNet features. By early next year, both Shiva and Xcellenet expect to provide this capability off the shelf.

"Our focus is to have one number to dial," said Frank Pleshe, network systems manager at Raychem Corp.'s telecommunication services division in Fuqueway-Varina, N.C. He said Raychem has 50 to 60 sales workers in the field using Xcellenet and Shiva products, both of which have previously required separate dial-in access.

News Shorts

Users advised about SunOS security flaw

Last week, the Computer Emergency Response Team (CERT) at Carnegie Mellon University issued an advisory to users about a security flaw in **Sun Microsystems, Inc.**'s SunOS. In the -oR option of sendmail, the vulnerability lets local users gain root access and then destroy any file in the system. The weakness "is currently being actively exploited by intruders," CERT said. More information can be found at ftp://info.cert.org/pub/cert_advisories/CA-95:11.README.

Driver makers talk merger

Seagate Technology, Inc. in Scotts Valley, Calif., last week announced it is negotiating a merger with **Conner Peripherals, Inc.** in San Jose, Calif. Under the deal, Conner stockholders would receive a 0.442 share of Seagate common stock for each share of Conner common stock. Analysts said the merger, if it receives regulatory approval, would produce the world's largest disk drive manufacturer.

IBM recalls PC monitors

IBM PC Co. is recalling its Model 9527 17-in. color monitors because of fears that improper grounding may cause electric shocks. IBM last week claimed that no incidents of shock have been reported so far and said it would repair affected monitors free of charge. IBM estimates it has shipped 140,000 units since September 1993. For more information, U.S customers can call (800) 426-7378.

HP agrees to buy Convex

Hewlett-Packard Co. has agreed to acquire Richardson, Texas-based large systems maker **Convex Computer Corp.** in a stock deal worth approximately $150 million. HP already owns a 5% stake in Convex and has resold its systems, which use HP's PA-RISC processors.

Microsoft bites, by mistake

It turns out that the culprit disabling several Internet browsers, including ones from **CompuServe** and **Spry, Inc.**, isn't The Microsoft Network but lies within **Microsoft Corp.**'s Windows 95 operating system. The problem, according to the company, is that the WINSOCK.DLL file, which has been added to a Microsoft operating system (Windows 95) for the first time, will automatically overwrite an identically named file, such as those developed by competitors when the WINSOCK.DLL wasn't part of the operating system. Fixes are available, including one from CompuServe.

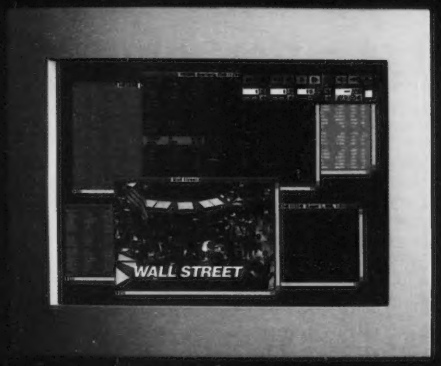
Amdahl bid countered

Amdahl Corp.'s deal to acquire **DMR Group, Inc.**, a Montreal consulting and services vendor, hit a potential roadblock when **BDM International, Inc.** made a higher bid. Amdahl, in Sunnyvale, Calif., said it expects to prevail because shareholders who control 80% of DMR's voting stock pledged to sell out to Amdahl at the price it bid two weeks ago. But BDM, also based in Montreal, claimed a separate class of shareholders could get voting rights under DMR's bylaws. Amdahl insisted its deal with DMR prevents that from happening.

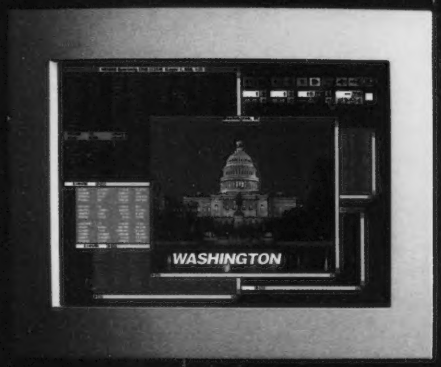
Digital rolls out Web servers

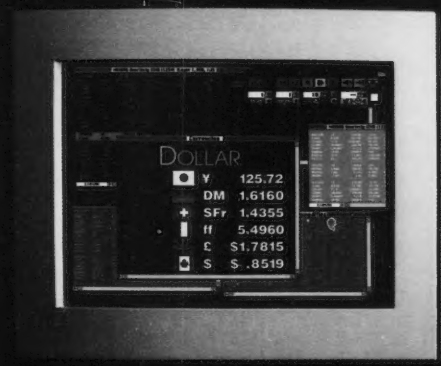
Digital Equipment Corp. this week is introducing a raft of World Wide Web servers running on its Alpha microprocessor and Microsoft's Windows NT operating system. The servers come loaded with **Netscape Communications Corp.** software and cost from $5,400 for a workstation model with a 100-MHz Alpha chip to $16,450 for a server with a 266-MHz Alpha processor.

SHORT TAKES **Data General Corp.** last week released DG/UX Release 4.1. It supports high levels of multiprocessor scalability and runs on both **Motorola, Inc.** and **Intel Corp.** chips. A new line of Intel-based servers is slated for October.... **Microsoft** sold its Microsoft Mail for AppleTalk to **StarNine Technologies, Inc.** in Berkeley, Calif. Macintosh users will get PowerPC support as well as greater Internet support under the StarNine ownership. The product will be sold as StarNine Mail and will include a free Unix to Unix Copy Program gateway for 10 users.... According to a report from **Dataquest, Inc.**, **Microsoft** captured a 90% share of the business application suite market by mid-year. The company also commands 66% of the total revenue from office applications, including suites, stand-alone sales of word processors, spreadsheets, databases and presentation graphics.... **Lotus Development Corp.** and **Intel** last week unwrapped RealTime Notes, which is based on Intel's ProShare personal conferencing technology and allows Notes users to videoconference.



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Coming to CA-Unicenter: Configuration management

StorageTek integration lets users manage silos, other enterprise devices from one workstation

By Thomas Hoffman
NEW YORK

Computer Associates International, Inc. used last week's otherwise lackluster Unix Expo '95 trade show to announce plans to manage RAID 5 fault-tolerant devices and for expanded distributed storage management capabilities for its CA-Unicenter systems management suite.

But CA's integration of Cheyenne Software, Inc.'s storage management software into CA-Unicenter is just the tip of the iceberg. CA has quietly begun providing extensions to CA-Unicenter to manage Storage Technology Corp.'s Timberline and other mainframe and Unix-based tape silos.

CA's StorageTek integration should be a major benefit for data center managers, many of whom would prefer to monitor their robotic tape storage devices and all other enterprise machines from a single workstation. For example, StorageTek had offered to resell Software Clearing House, Inc.'s silo monitoring software to Commerce Clearing House, Inc., a tax and business law publisher in Riverwoods, Ill., that uses StorageTek's Powderhorn silo to house tapes from its Hewlett-Packard Co. HP 9000 Unix servers.



MCI's Ann Haehn *welcomes CA's automated change management tools.*

"But we didn't want to go that way, since we've already got Unicenter and would rather manage the silo and other functional points using one product," said Dave Dubnick, manager of technology operations at Commerce Clearing House.

CA also revealed plans to integrate change and configuration management features, which provide audit trails of all changes to applications, into Unicenter.

The game plan

CA's strategy was aided in part by Legent Corp.'s Endevor mainframe product, which CA acquired last month. CA had been building the functions into Unicenter prior to the Legent acquisition because they "needed to come out with a multiplatform solution to manage Windows NT, Unix and other environments anyway," said Yogesh Gupta, senior vice president of product strategy at the Islandia, N.Y., software leviathan.

That suits MCI Communications Corp., a CA-Unicenter shop that plans to use CA's latest version of Unicenter to manage its newly installed Digital Equipment Corp. Alpha Unix workstation environment.

"Without these [automated change management] tools, you've got to do a manual inventory of [the hardware and software] you've got within your [enterprise] configuration," said Ann Haehn, midrange tools support manager at MCI in Colorado Springs.

But not all Unicenter customers are excited about the new features. For example, National-Standard Co. isn't interested in the forthcoming Unicenter-enabled Cheyenne storage management offerings because HP already provides disk mirroring and RAID capabilities for its Unix servers, said Gene Kiefer, a senior systems programmer at the steel wire manufacturer in Niles, Mich.

"We'll probably look at the HP [storage] software. Not that I don't get good support from CA, but you get a better comfort level going with the manufacturer of the box," he said.

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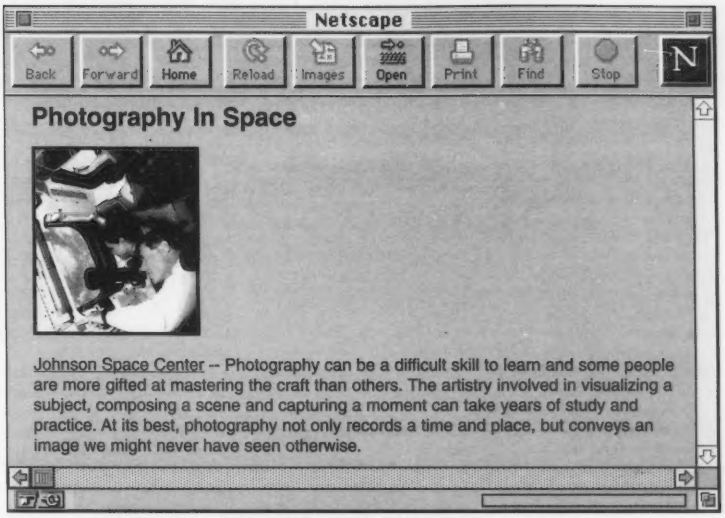
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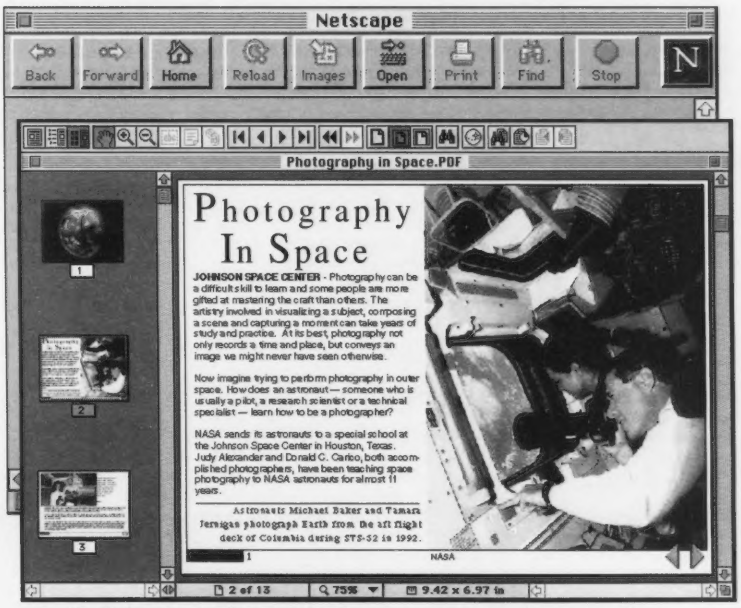
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AT&T units tout improved modem technology

By Bob Wallace

AT&T's Bell Laboratories and Paradyne network equipment unit are putting the finishing touches on a technology that will enable carriers to dramatically cut the cost and broaden the reach of high-speed data services.

The technology, called GlobeSpan Symmetric Digital Subscriber Line (SDSL), is expected to be available for use in modems by year's end.

High-speed data services

It can run up to 1.54M bit/sec. in each direction over existing carrier networks.

"The impact of this technology could be phenomenal," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Verona, N.J. "Carriers could offer T1s to business users and homes for $10 a month instead of today's $400-to-$1,000 rate."

Improvements anticipated

GlobeSpan promises to change the way businesses and residential users use carrier-provided data services. The technology could do the following:

- Support high-speed Internet access, whiteboarding and desktop conferencing applications.
- Give users a much faster alternative to 28.8K bit/sec. modems for remote LAN access.
- Offer huge improvements over other data services, such as Integrated Services Digital Networks (ISDN).

"This could eliminate the need for ISDN and associated access equipment by offering users over 10 times the bandwidth of a Basic Rate Interface line at a lower cost," Briere said.

Cabling remains the same

GlobeSpan SDSL doesn't require special cabling. Telephone lines will continue to handle ordinary telephone calls using one frequency and support data connections at up to T1 speed with a different frequency.

Clete Gardenhour, director of business development at Paradyne, said the AT&T-developed technology supports links of more than 19,000 feet at 128K bit/sec. and 17,000 feet at 384K bit/sec.

GlobeSpan SDSL doesn't require any equipment or cabling changes to existing carrier networks, whereas data services often require special repeaters to boost the signal and line-conditioning gear.

One potential user is Bell Atlantic Corp., which is testing Paradyne's technology in its current video dial-tone trial. Users pay $7.95 a month to receive data at T1 speed and send data at 64K bit/sec.

"Nobody has put down a big order for SDSL," Briere said. "Just one big order would get the equipment produced in large volumes and begin to show other carriers what the technology can do."

But Paradyne also has to contend with AT&T's Network Systems Group, which primarily sells switching and transmission systems, while it focuses on products that help carriers make the most of their existing networks.

Send in the agents

'Common agent options' could streamline client/server but industry support wavers

By Steve Moore and Patrick Dryden

Several leading client/server vendors pledged last week to streamline the gathering of management data from far-flung client and server machines by linking emerging and established reporting technologies.

Upcoming products from Apple Computer, Inc., IBM and Sun Microsystems, Inc. will offer "common agent options" beginning early next year. But other key vendors, such as Microsoft Corp. and Hewlett-Packard Co., were conspicuously absent from the group.

This common agent software looks for data that client/server systems present to the Desktop Management Interface (DMI), a standard for LAN administration. The agent translates DMI information for delivery to network and systems management consoles via the Simple Network Management Protocol (SNMP).

Users said such client/server management standards are overdue.

"I hope all the client/server players can agree on standards, or they will slit their own throats. We can't change our enterprise management system every six months," said Dan McPhillips, telecommunications program manager at the U.S. Postal Service. "Standardizing the standards is a big move in the right direction."

McPhillips views management standard efforts through his IBM SNA network experience. "IBM was always out alone, so we got into trouble if our network wasn't pure Blue from one end to the other," he said. "Maybe this common agent means IBM and others have learned the lesson that they can't just do things their own way."

Bringing it all together

Diverse products at the end of a network link use the DMI as a common way to communicate status information. However, networks rely on SNMP to alert central consoles about the status of links and, increasingly, of vital devices and applications. Common agent technology converts DMI information to SNMP. This extends the reach of existing SNMP management platforms to the stations, printers and applications.

"This common agent addresses DMI in a way that makes sense to existing products and tools, prevalently [those based on] SNMP, that are familiar to users," said Leo Cole, IBM's manager of SystemView technology.

But the Desktop Management Task Force (DMTF), the industry group that developed the DMI standard, views the IBM-driven common agent as an interim step toward wedding the two management worlds.

"What IBM is doing to map DMI information to SNMP is an interim solution for people who need that today," a DMTF spokesman said. He added that the Remote DMI specification [CW, Aug. 28], which is expected to be completed by the end of the year, "will ultimately solve the total problem."

How common is it really?

But analysts pointed to the absence of HP, Microsoft, Computer Associates International, Inc., Tivoli Systems, Inc. and other key vendors from the group of firms supporting the new common agent technology.

"How common is this [agent technology] really going to be if IBM did not consult HP in coming up with this and if Microsoft is not supporting it?" asked Jill Huntington-Lee, a senior analyst at Datapro in Delran, N.J. "It is not really an industrywide standard."

In offering software developer kits with which Microsoft Windows 95 and Windows NT systems can be made fully compliant with the DMI standard, IBM and its allies "certainly fired a shot across Microsoft's bow," added John McConnell, president of McConnell Consulting Co. in Boulder, Colo.

Microsoft previously said it won't comply fully with DMI and instead will substitute its plug-and-play technology for the DMI's Component Interface [CW, Nov. 21, 1994]. Microsoft declined to comment on IBM's agent technology.

HP is "concerned that what IBM is proposing could become obsolete once [Remote DMI] is available," said Gordon MacKinney, OpenView program manager.

Cabletron

CONTINUED FROM PAGE 1

the void in the vendor's switch line.

"The MMAC has been widely successful, but the MMAC-Plus has way too many capabilities and is far more expensive for the average user," said one analyst who requested anonymity. "Bay, with its System 5000, and Chipcom, with the Oncore Switching System, have been eating their lunch."

A Cabletron spokesman confirmed plans for a press announcement at the show here but would not comment further.

Additional features available

The SmartSwitch stand-alone switching hub can be equipped with a subset of the features offered in the larger MMAC-Plus. They include Ethernet, Token Ring, Fiber Distributed Data Interface and Asynchronous Transfer Mode switching.

"This isn't a mini-MMAC-Plus per se," one analyst said. "It's a hub that will enable users to start small and grow at their own pace, possibly into the larger MMAC-Plus."

The product line problem has become so big for Cabletron that one analyst reported that the vendor has bid two MMACs — a kludgey scheme — rather than one MMAC-Plus to users looking for a powerful and more affordable midrange switching solution.

MMAC users who don't want to move to the stand-alone SmartSwitch will have another midrange option: a new module that can be plugged in to existing MMAC switches, analysts said.

This SmartSwitch module enables users to protect their MMAC investment while adding support for advanced capabilities such as high-performance LAN switching.

The module doesn't tie up a slot in the eight-slot MMAC chassis but does tie into the box's management bus and draws on the hub's power supply, analysts said.

The expansion capabilities offered by SmartSwitch are sorely needed, one analyst said. Only about 30% of the real estate inside MMACs in user networks is available for system expansion, which is low given that many users expand their hubs at a fast pace.

Smarten up

Cabletron's planned SmartSwitch product line comprises a stand-alone switching hub and add-on modules for the midrange MMAC and the high-end MMAC-Plus

SMARTSWITCH PRODUCTS . . .
. . . are based on a new Cabletron ASIC that processes 750,000 packet/sec.
. . . can support up to 16,000 media access control addresses
. . . are expected to ship in six months
. . . have no set prices yet

Though Cabletron isn't expected to provide pricing and other details at the SmartSwitch announcement, analysts said the products could ship within six months. The vendor has shown analysts prototypes of the new units.

Farallon tries one-stop shopping to give its new router a chance against the likes of Cabletron. See page 90.

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AT&T breaks up (again)

What's the buzz?

"I haven't had this much camera attention since I walked once with Demi Moore into a room."

– AT&T Chairman Robert Allen at last week's press conference in New York

"This shows that some of the allegedly staid and bureaucratic outfits can show vigor and move quickly and do the right thing. I take my hat off to Robert Allen to have the foresight to learn from the mistakes of other companies."

– Bob Djurdjevic, analyst, Annex Research, Phoenix

"That's the best thing that's ever happened [to the former NCR Corp.]. The worst thing was being bought by AT&T."

– Michael Garrison, manufacturing and industrial engineering manager, State Industries, Inc., Ashland City, Tenn.

AT&T

CONTINUED FROM PAGE 1

puter business, the former NCR Corp.

The telecommunications giant's new goal is to enable each unit to compete in the upcoming world of deregulated telecommunications — unfettered by the baggage and bureaucracy that comes with being a $75 billion behemoth.

For example, AT&T Chairman Robert E. Allen last week said the network products group had encountered difficulty selling to regional Bell operating companies and to international carriers because those companies viewed AT&T as a competitor.

What managers foresee

But for corporate information systems and telecommunications managers, the result will be a mixed bag that will leave many watching the dismantling with a wary eye.

Viher applauded the breakup because it will allow each unit to be more flexible. But the communications manager said he will lose the relationship with AT&T that allows him to order what he wants — services, a new switch or a computer — from one person. The breakup "is just making it harder for large companies," he said.

Long distance accounts for 95% of AT&T's telecom services revenue; wireless is the other 5%, according to Annex Research in Phoenix.

Dealing with multiple AT&Ts will cause IS managers "a big systems integration headache," agreed Peter Kastner, an analyst at Aberdeen Group, Inc. in Boston.

The other view

However, Harry Hurley, manager of telecommunications services at Ceridian Corp. in Minneapolis, said he would rather deal with separate companies. Hurley said AT&T was difficult to work with because sales reps were trying to cross-sell products for other units.

Hurley predicted that "each [piece] will do better as a separate entity" focusing on its core business.

The big breakup, which is expected to take until late next year to complete, has also created an expectation that it will accelerate product development.

"I can only foresee a more nimble AT&T with better and more innovative products," said Chris Stellwag, marketing communications director at Transquest Information Solutions in Atlanta, a joint venture between Delta Air Lines and AT&T.

Daniel Briere, an analyst at TeleChoice, Inc. in Verona, N.J., said he envisions AT&T's doing something like more effectively marketing its Universal Card credit card with its telephone services, adding electronic billing.

He also predicted AT&T's network unit will bring users more bandwidth at cheaper prices.

Ken McGee, an analyst at Gartner Group, Inc. in Stamford, Conn., said AT&T is preparing for deregulation, which is expected to be approved by Congress this fall. He said AT&T "arrived at the right conclusions" by splitting services from network hardware.

Big breakup

	AT&T (Communication services)	As-yet unnamed (Network systems)	Global Information Solutions (Computer systems)
Revenue	$49B	$20B	$8B
CEO	Robert Allen	Richard McGinn	Lars Nyberg
Employees	121,000	137,000	43,000
	• AT&T Universal Card Services • AT&T Solutions • AT&T Wireless • AT&T Laboratories	• Global Business Communications Systems • Consumer products • AT&T Paradyne • Microelectronics	• Formerly NCR Corp. • AT&T's current computer unit

& AT&T launches an on-line service. See page 24.

NCR unplugged has GIS users gleeful

By Neal Weinberg

Loyal NCR Corp. customers, who still refer to AT&T Global Information Solutions by its pretakeover name, aren't exactly broken up by AT&T Corp.'s decision to restore the computer company to its independent state.



Associated Grocers' Richard Lester: *Any increased emphasis on retail equipment would be 'positive'*

In fact, except for the 8,500 layoffs, users couldn't find a downside to a freestanding company restructured to focus on core markets such as retail, banking and communications.

"That's the best thing that's ever happened," said Michael Garrison, an engineering manager at State Industries, Inc. in Ashland City, Tenn. "The worst thing was being bought by AT&T."

Garrison said that when the takeover occurred in 1991, he thought AT&T's deep pockets would help Dayton, Ohio-based NCR. "Instead, what happened in my opinion is that they took a good, successful company and screwed it up." For example, Garrison said he used to have weekly contact with an account manager, which he lost when AT&T GIS went to a different sales strategy. "Believe it or not, that makes a difference," he said.

Charles Shull, a vice president and systems analyst at Los Alamos National Bank in Los Alamos, N.M., is another disgruntled user. His bank sued AT&T GIS after a software conversion project ran into problems. "A few years back, NCR was a good company," Shull said. "They were a lot more responsive to customers' needs."

New AT&T GIS Chief Executive Officer Lars Nyberg last week acknowledged that 80% of the company's problems were internal. "It's us not doing the right things," he said.

But he vowed to turn the computer unit around by slashing costs, dumping the PC business and focusing on core markets. In addition, AT&T GIS will launch WorldMark, a line of symmetric multiprocessing servers, next week.

Looking forward to those changes is Richard Lester, vice president of information services at Associated Grocers, Inc. in Seattle. "We are a heavy user of NCR retail equipment. To the extent they increase the emphasis on retail, that's positive for us," he said.

Friends and family not surprised

MCI Acquisitions

While one phone giant hacks itself into pieces, another is making itself bigger.

Amid the hubbub over AT&T's breakup last week, MCI Communications Corp. said it will buy SHL Systemhouse, Inc., an Ottawa-based systems integrator, for $1 billion in an effort to augment its corporate information technology offerings.

In direct contrast to AT&T's move, the deal is part of MCI's ongoing effort to broaden its appeal to corporate users by riding a wave of fusion between telecommunications and computing technology.

MCI will operate SHL Systemhouse as an independent company, merging MCI's WAN consulting services organization into SHL.

SHL Systemhouse specializes in moving big companies off mainframes, said John Oltman, its chairman and chief executive officer. Customers include National Steel Corp., British Airways and Amoco.

SHL expects about $1 billion in U.S. revenue for its fiscal year 1995, which closed Aug. 31. Its 1994 revenue was about $985 million. MCI expects the deal to be finalized in mid-November.

—Mitch Wagner

SAP's R/3

CONTINUED FROM PAGE 1

Release 3.0 next year. By customizing the software, he figures SAP can cut implementation times from the current seven to nine months per module to four to six months. A full-blown R/3 system contains more than 75 modules.

R/3 also contains thousands of screens and hundreds of tables and parameters, which users must choose and set. Given the long configuration times involved, users have traditionally viewed R/3's wide range of features and functions as both a blessing and a curse.

As for an R/3 Lite version, which SAP had talked up a year ago, all plans have been scrapped for good, Plattner said. The reason is that SAP had "major problems" deciding what to eliminate in a scaled-back version. Under the preconfiguration plan, users will dictate which functions SAP should include in their systems.

Mixed response

Last week, users expressed curiosity mixed with skepticism about the preconfiguration scheme.

"I was fascinated," said Jim Cross, a systems analyst at Aramco Services Co. in Houston.

If it works, "that kind of thing could save you hundreds of dollars and hours in implementing a system," he added.

Perhaps what is most intriguing about SAP's customization plan is that it involves no traditional customization whatsoever. Instead, unwanted features of the integrated business software will be masked from a customer's view. That way, all of R/3's features will still be there if and when a customer opts to implement them. Pricing, Plattner said, would remain the same as with fully activated R/3 components, with license fees based on the number of users.

But what the scheme actually does to reduce users' implementation time remains to be seen. Also yet to be proved is SAP's ability to deliver the preconfiguration capabilities.

As Plattner envisions it, SAP sales representatives using dynamic configuration tools based on object technology will configure an individual R/3 system in "between five and 10 minutes" on an airplane en route to a customer site. SAP said it is testing this technology with six customers, but it would not disclose who they are.

"On one hand, it should be very easy to do [because] you're just shutting stuff off," said Josh Greenbaum, a Berkeley, Calif.-based consultant at Hurwitz Consulting Group, Inc. "But my suspicion is that it is going to be very difficult to put it [the technology] in a form that a salesperson can use."

Client/server software coming into its own. See page 99.

FileNet works imaging into R/3

FileNet Corp. last week became the first major U.S. imaging vendor to image-enable SAP's R/3 software.

The Costa Mesa, Calif.-based company's Document Warehouse for SAP lets users scan documents into image files that can be associated with an R/3 object, such as a purchase order. Users can then create the order and later view both the order and the image file. The FileNet software also archives documents that go out from the R/3 system, such as price quotations and order confirmations.

"The FileNet agreement adds very high-level services for automating document capture and storage," said Gerry Murray, an analyst at International Data Corp. in Framingham, Mass. "R/3 is primarily a processing environment, but it doesn't address the issue of how to get the data into it."

FileNet has been integrating its imaging systems with R/3 on a case-by-case basis for the past year. Prices start at $80,000 for a 16-user configuration.

—Tim Ouellette



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Netscape to 'Collabra-rate' on groupware

By Kim S. Nash and Suruchi Mohan

Hot on the heels of its multimillion-dollar public offering last month, Netscape Communications Corp. will quickly put some of that money to use with plans to buy groupware developer Collabra Software, Inc.

In return for an estimated $100 million worth of stock, Netscape will gain an alternative to Notes for workgroup computing. Privately held Collabra in Mountain View, Calif., is known for its Share groupware product. The purchase will be accomplished via a swap of more than 1.85 million shares of Netscape stock.

Which way to go

The pending acquisition throws gas on an already fiery debate among information systems managers over which medium is better for collaborative computing: self-contained commercial groupware products such as Notes or homemade systems built on the existing World Wide Web infrastructure.

However, once the merger is complete, expected by the end of January, it could take another eight to 12 months for Netscape to fully incorporate Collabra's technology into its browser. This means users may have to wait as long as a year to get their hands on the integrated product.

Intrigued users may be willing to wait, analysts said.

"People with corporate Internets have been looking for ways to make their internal Webs more groupwarelike, and this may be it," said David Yockelson, an analyst at Meta Group, Inc. in Stamford, Conn.

Defense contractor Millipore Corp., for example, is weighing when and how to supplement its 1,300-seat Notes installation with Web-based groupware, said Kevin Danehy, a senior business analyst at the Bedford, Mass., company.

"For the simpler applications, Notes can be overkill," Danehy explained.

One of the distinguishing features of Share is its ability to run atop several messaging systems, such as Microsoft Corp.'s Mail and Lotus Development Corp.'s CC:Mail. Notes, on the other hand, is more proprietary, running only on its own electronic-mail system.

Collaborating on the deal

Netscape plans to buy Collabra with 1.85 million shares of Netscape stock, a deal estimated at $100M as of press time

	Netscape	Collabra
Founded	1994	1993
Employees	325	47
Private/public	Initial public offering August 1995	Privately held
Key products	Navigator Web browser, several Web servers	Share groupware package

Short-lived advantage

However, Notes does have some advantages, including support for Microsoft's OLE technology, true workflow and built-in security, said David Coleman, principal at Collaborative Strategies in San Francisco. "Within a year, most of these [advantages] will have disappeared," he predicted.

Netscape plans a gradual integration of its Navigator Web browser and Collabra's Share. The effort will likely culminate in Navigator 3.0, which is expected near the end of next year, said Mike Homer, director of marketing at Netscape.

Meanwhile, Netscape Navigator 2.0, an upgrade to Netscape's popular Internet browser now in beta testing, includes some threaded discussion and E-mail capabilities.

Netscape flaw poses threat

CONTINUED FROM PAGE 1

scape uses to create encryption keys (see story below).

The Mountain View, Calif., vendor promptly vowed that a free fix would be available at its World Wide Web site early this week (see chart).

To skirt the more glaring security mishaps and catch some of the less visible ones, Netscape and other vendors should be more willing to open up their products to the scrutiny of outsiders before they offer commercial versions, users and analysts said.

Surfing a secure 'net

Following are Netscape's fixes for the security holes in Navigator

Security issue	Fix
Netscape products use a relatively weak 30-bit encryption key	Netscape plans to pump up the key to 300 bits, starting with a patch that users can download from the company's Web site at http://www.netscape.com. Future products will also use 300-bit keys.
Quality testing	Netscape has called in known hackers and security experts to stress-test new products.

In fact, Netscape now plans to do that to a degree. The company has enlisted a group of well-known hackers, the Cypherpunks, along with several security experts, to stress-test its future products, said Atri Chatterjee, director of server marketing at Netscape.

Several security experts noted, and Netscape officials acknowledged, that the breach could have been avoided with more thorough testing.

Netscape's latest security fault "shows some degree of sloppiness," said Sanjay Dani, president of Web Professionals, Inc., a Web service provider in Cupertino, Calif. "This will unsettle quite a few folks for awhile."

Yet users running Netscape in on-line commerce applications probably don't have much to fear, said John Pescatore, a security analyst at Infovision International in Falls Church, Va. Although the students were able to figure out how to generate a decryption key for a single Internet test session running on their PC, a real-world hacker would have had to first break into the user's network and capture data packets moving over it, he said.

The real danger lies in a widespread misunderstanding of how safe one can reasonably expect the Internet and the software that runs on it to be, said Winn Schwartau, president of Interpact, Inc., a security consulting firm in Seminole, Fla.

Even when software vendors take care with security, users can't be 100% sure they are protected, Schwartau said. "Verifying the implementation of security is a nightmare; it's extraordinarily complex," he said. He advised users to buy mature products from security-conscious vendors.

Yet users and analysts are worried that security problems may squelch firms' plans to do business electronically.

"A hack is like a plane crash," said Scott Randall, general manager of NECX Direct, a computer retailer that sells software and hardware over the Internet. "More people die from heart attacks than plane crashes, but it's the one plane crash that draws people's attention to it."

Unlocking the door

The latest Netscape security hole was discovered by two graduate students in computer science at the University of California at Berkeley. They didn't crack any encryption, per se. Rather, they reverse-engineered the instructions that Netscape uses to create encryption keys during so-called secure sessions. Once the students figured out how the keys were generated, they produced their own key to unlock a session that was in progress on their PC.

The procedure was akin to a neat burglary, according to William J. Orvis, team member at the Computer Incident Advisory Capability at Lawrence Livermore National Laboratory in Livermore, Calif.

"What they did was figure out how the decryption key was calculated," Orvis said. "A good analogy is breaking into a house by knowing that a key is under the mat instead of smashing down the door."

To expose this security hole, the students had to violate the license distributed with Netscape products, which stipulates that users won't disassemble the program, said Jeffrey Schiller, an Internet security expert at MIT. —*Kim S. Nash and Gary H. Anthes*

Users get tools for Web site searches

By Kim S. Nash

Information systems shops have begun to experience needle-in-the-haystack kinds of problems searching through the vast amounts of data available on their internal Internet sites.

To address the situation, Open Text Corp. and IBM last week each announced tools built to help users more easily index and search information on internal World Wide Web sites.

The products should benefit large companies, such as McDonnell Douglas Corp. and Chevron Corp., which have their own mini-Internets but often lack an easy way to peruse the data, said John Krick, an analyst at Datapro Information Services Group in Fort Lee, N.J.

"People are getting excited about building internal Webs, but they may not necessarily understand that there's no easy way to search through all that data once they get it on-line," Krick explained.

Those who use internal corporate Web sites account for roughly 50% of an estimated 14 million total Web users, according to a recent report jointly researched by First Albany Corp., a brokerage firm in Boston, and Meta Group, Inc., a consultancy in Stamford, Conn.

The new products are due to ship between now and early next year.

Open Text in Waterloo, Ontario, announced Search Server, a $12,000 package that IS staff can program to categorize internal Web information.

IBM announced Infomarket, a free search service available on the Web. The product indexes Internet resources and information already sorted by other search facilities.

Multinational companies try to bridge language gaps on the Internet. See The Internet Page, page 76.

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IBM jazzes up MQSeries for client/server users

By Craig Stedman

To make its MQSeries messaging middleware more palatable to users outside the data centers, IBM this week will introduce a jazzed-up version for developing three-tiered client/server applications, *Computerworld* has learned.

For starters, MQSeries Three Tier provides badly needed links to graphical user interface (GUI) development tools such as IBM's VisualAge. It also adds compilers, testing tools and zippier program-triggering routines to MQSeries, which let pieces of distributed applications communicate via asynchronous messages. The messages are stored in queues to await connections while processing continues.

An IBM official confirmed MQSeries Three Tier will be announced at this week's Networld/Interop '95 conference in Atlanta. IBM already posted a customer announcement detailing the product on its World Wide Web home page.

Shipments will start in late October for IBM's OS/2 and AIX operating systems.

IBM had confirmed earlier this year that it was working on the three-tiered version of MQSeries [CW, April 3]. The middleware has scared off most customers outside of large mainframe shops, but users and analysts said the upcoming version should reduce MQSeries' complexity.

"[Three Tier] is what IBM needs to make MQSeries easier to work with," said Sally Cusack, an analyst at The Standish Group International, Inc. in Dennis, Mass. "Before, it was a systems administrator-type thing rather than an end-user tool. Three Tier is one way to help shed that big-shop image."

TIERS THAT BIND

IBM's MQSeries Three Tier software includes the following features

COMPONENTS
- OS/2 and AIX class definition compilers
- Test harness and application simulator (OS/2 only)
- Client and server runtime support

LANGUAGE AND GUI TOOL SUPPORT
- **OS/2:** C/C++, Cobol, PL/1, IBM VisualAge
- **AIX:** C/C++ for servers; same as OS/2 for clients

PRICE
- $5,000 for first license; $4,500 for additional licenses

AVAILABILITY
- Oct. 27

Jerry St. Marie, manager of on-line systems solutions at Connecticut Mutual Life Insurance Co. in Hartford, Conn., said the Three Tier package looks interesting as a client/server tool. The insurer, which signed a merger deal two weeks ago with Massachusetts Mutual Life Insurance Co., has chosen MQSeries as its communications infrastructure for distributed computing.

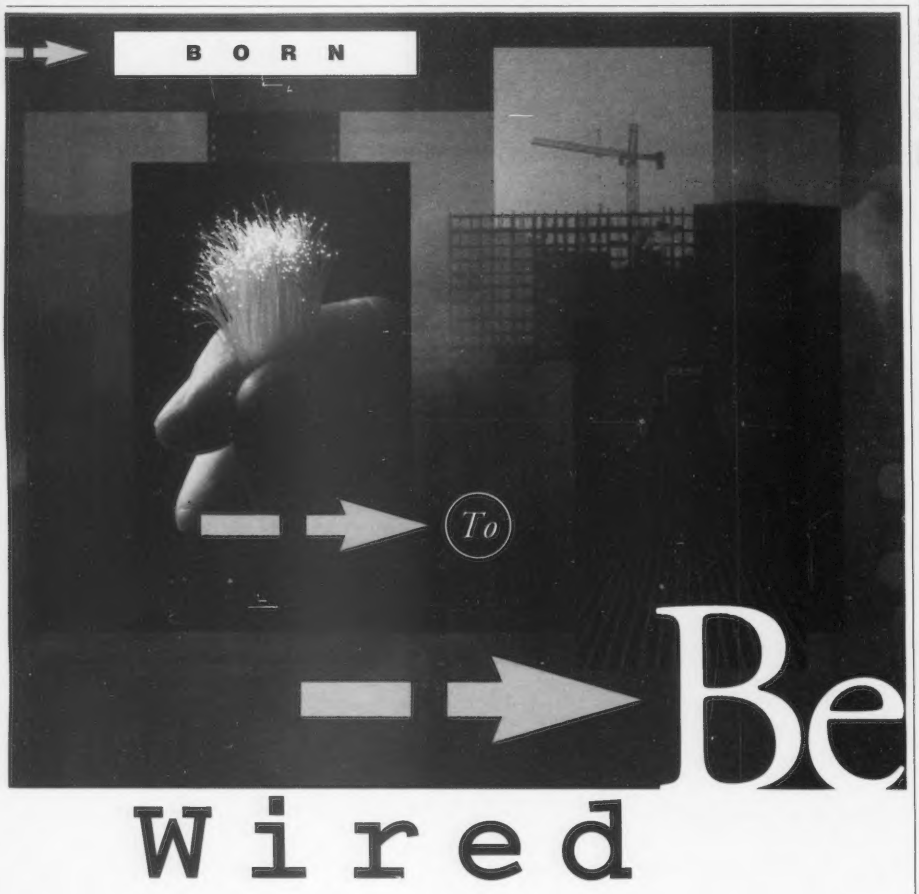
The new version should address some of the development complexity issues posed by MQSeries, St. Marie said. "Our architects were impressed with it, and it's an option for our client/server development," he said. "But there are other options, and the architects haven't made that call yet."

Getting it all together

Code-named Oak, MQSeries Three Tier is targeted at customers who want to combine pieces of existing mainframe applications with client/server programs. New code will enable the middleware to act as a rules-based engine that keeps the different parts of an application in sync with one another, IBM said.

Direct support is included for both the Smalltalk and C++ flavors of VisualAge, IBM's object-based development tool. Other GUI tools can be linked into MQSeries Three Tier manually, IBM said.

The product also includes client and application server runtime licenses, plus hooks for connecting clients to mainframes and other data servers that are running MQSeries. However, a separate MQSeries license is required at the data server level.



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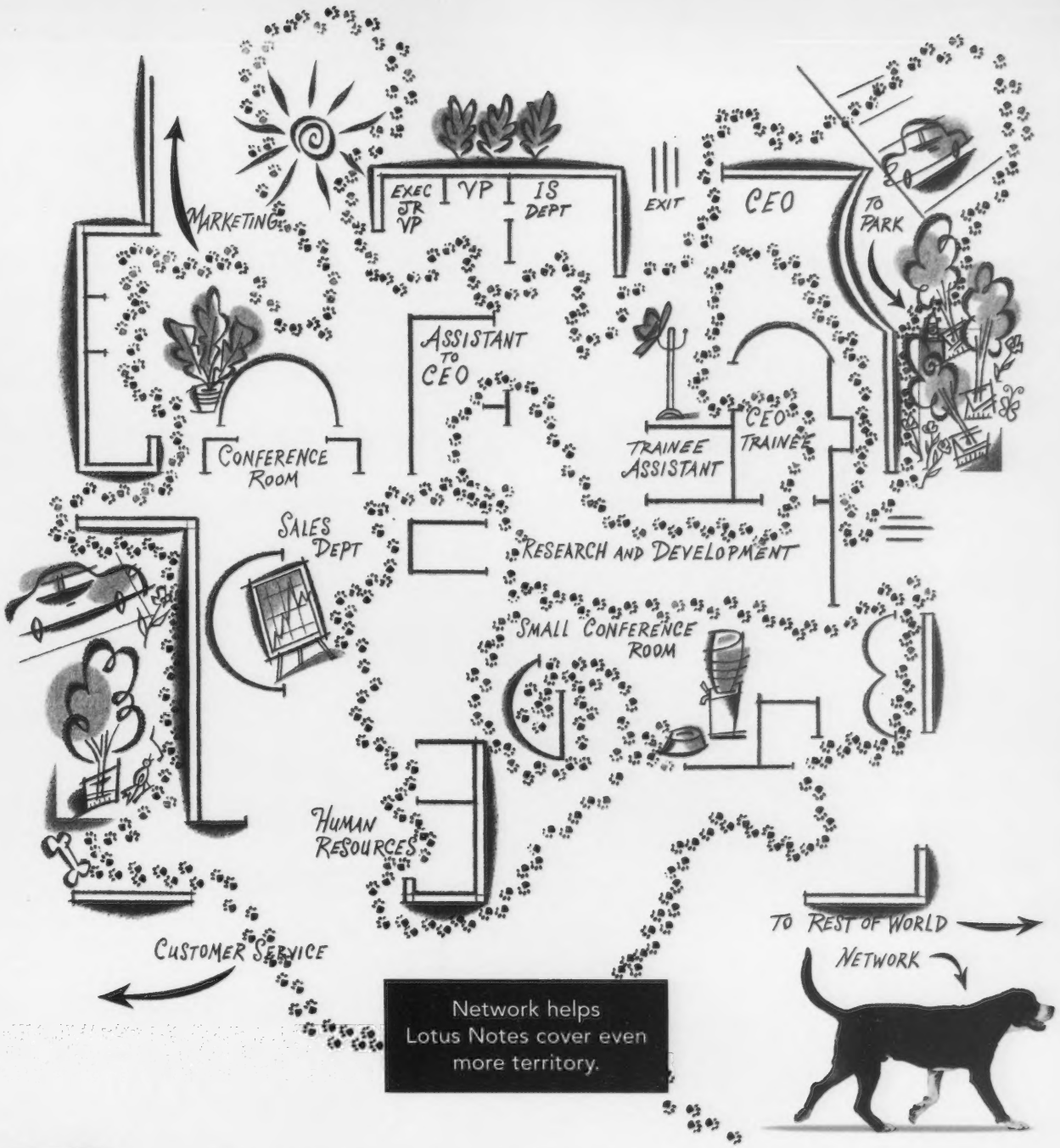
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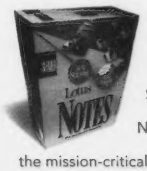
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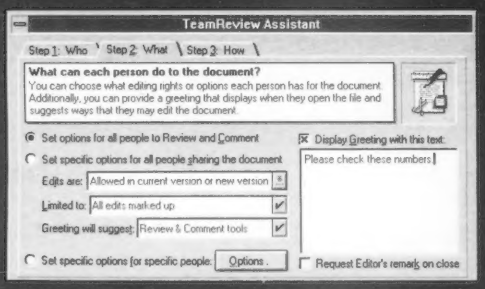




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September 30, 1995

Arthur's on vacation until Oct. 15 - date it + send late that week.

Mr. and Mrs. Arthur Sweetser
126 Squires Road
Marco Island, Florida 33969

zip?

Dear Arthur and Cindy,

with Rebecca

I have reviewed your estate plan as reflected in your present Wills and the schedule of assets that you left with me. My comments and suggestions follow.

recently

Your present Wills provide the desired flexibility to determine after the first death the amount of marital deduction to be utilized in order to achieve the best federal estate tax result. A problem arises, however, by reason of the way you presently hold assets. In the event Arthur is the first to die, his two IRAs and Annuity would pass to pursuant to the beneficiary designations in place, leaving no assets with which to produce a taxable estate and utilize any of Arthur's available unified credit. While there will be no federal estate tax payable on Arthur's estate, the tax in Cindy's estate may well be higher than it needs to be by reason of the failure to use Arthur's unified credit.

COMBINED

attach designation

IS THIS TRUE? PLEASE CALCULATE

Can we insert a table here?

To illustrate the foregoing, using the values contained on your Schedule of Assets, and assuming Arthur dies first and that Cindy dies one year later with no change in asset values, arthur's gross estate for federal estate tax purposes would be $580,007.00 representing the sum of the two IRA accounts and the annuity. Assuming no administration expenses, there would be a marital deduction taken in the amount of $580,007.00 since each of the assets making up the gross estate pass to Cindy, producing a taxable estate of -0-. Upon Cindy's death, her gross estate for federal estate tax purposes will equal $2,432,012.00, representing the sum of the above assets received for Arthur, the investment account, her IRA, the primary residence, and the New

Can you give me some backup?

What are the chances of this?

AT&T launches business Internet service

By Neal Weinberg

Early users say they signed up for AT&T Corp.'s recently unveiled managed Internet access based on expectations of reliability and existing relationships with the long-distance service provider.

That must offer some comfort to AT&T, which had lagged behind its competitors in offering Internet services. But these days, AT&T and its new partner, BBN Planet, are making a serious effort to catch up. Last week, they launched nationwide availability of managed Internet service for businesses and promised dial-up access trials within two months.

John Krick, an analyst at Datapro Information Services Group in Delran, N.J., said AT&T should become a formidable force in the Internet access market simply by leveraging its huge base of customers — many of whom are very comfortable with the company.

"Everybody and his brother is doing this, and that's the problem," because it is difficult for users to choose a company, said Nic Di Iorio, director of information technology at McCann-Erickson Worldwide, an advertising agency in New York. "We want someone who can give us some degree of reliability and minimize the things that can go wrong."

Several McCann-Erickson units already have home pages, but AT&T is setting up a unified home page for customers and affiliates in more than 100 countries. Di Iorio said he chose AT&T because of its reputation for reliability and service. He said he was sold by the combination of AT&T's network and BBN Planet's Internet expertise.

The Associated Financial Network, an Indianapolis-based group of insurance and financial services companies, has also picked AT&T to provide its Internet access, said Ed Leer, vice president of corporate networks at Associated Financial.

On-line services

The relationship between AT&T and Associated Financial was a major selling point, he said. The network signed a contract earlier this year with AT&T for the construction of a nationwide frame-relay network, and Internet access will be folded into that project. Leer said it will be cheaper to have AT&T handle both projects than to have another Internet provider start from scratch.

Promus Hotel Corp. in Memphis signed up for AT&T's Internet service the first day it was offered, said Norman Cavin, director of consumer marketing. The hotel chain plans to take reservations over the Internet by the end of this month.

Steve Sazegari, an analyst at Tele-Mac in Foster City, Calif., said the prices that AT&T has announced "sound reasonable." The only question is how AT&T will negotiate rates with current customers.

AT&T said local-access charges would range from nothing to standard tariff prices, depending on current arrangements.

Going on-line

AT&T last week announced the launch of an on-line service for business users. The service is expected to be available in December.

AT&T Business Network will feature everything from newspapers and magazines to travel services and research tools. It will also have connections to the Internet.

AT&T Business Network will cost $39.95 a month for 10 hours of connect time plus $2.95 for each additional hour.

—Neal Weinberg



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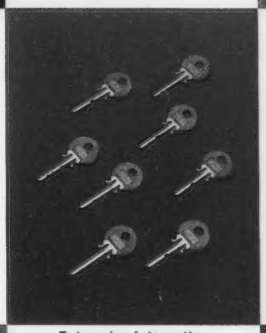
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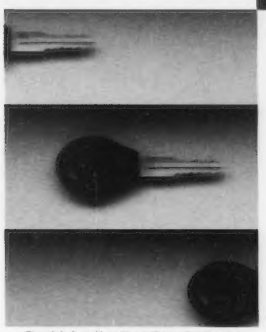
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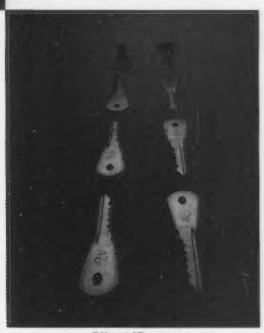
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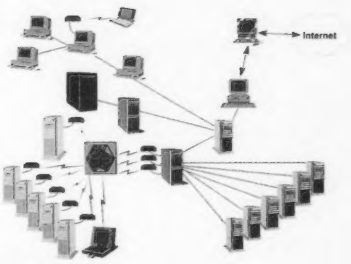
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He was also the first to see that AS/400 Advanced Series could do all this with lower administrative costs than other platforms.

When your business grows from zero dollars to a billion dollars in five years, choosing a client/server system that can keep up with the growth is pretty important.

Which is what Bill Downs of Sega has found with AS/400 Advanced Series.

"In five years, we probably would have had two or three different business systems if we had started with something that didn't scale as easily as AS/400," says Bill. "None of us had the idea we would grow as fast as we did."

Bill has his AS/400 Advanced Series running the entire business. He's using it to process orders and schedule delivery to 20,000 retail stores overnight. He has his company's PCs, Macs and Silicon Graphics workstations running off it. And his AS/400 Advanced Series does all this with a technology budget of less than two-tenths of one percent of revenue, and with minimal support staff.

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Software pirates treasure Win 95

By Tim Ouellette

Software pirates have boarded Microsoft Corp.'s new ship of state — Windows 95 — and are in the process of taking the plunder.

The bootleggers have been eagerly copying the beta version of Windows 95 since it came out [CW, July 24], and several Hong Kong retailers were reported to be selling counterfeit versions of the final Windows 95 product just days before its Aug. 24 release.

"We have no specific proof yet of counterfeit copies of the final Windows 95 version here [in the U.S.] or abroad," said Diane Smiroldo, a spokeswoman for the Business Software Alliance (BSA), an industry antipiracy group in Washington. "But as soon as Windows 95 came out, we can almost guarantee people were pirating it."

Bootlegs on disc

Most counterfeit copies of Windows 95 are found in compilation CD-ROMs, which usually include a number of pirated applications and sell for a fraction of the total cost of the separate products. A stand-alone, boxed counterfeit version of the final Windows 95 is expected eventually.

"We don't yet see the fully packaged product," said Christine Santucci, spokeswoman for Microsoft's antipiracy program, meaning the sale of a complete look-alike product, with the software and manual found in that box with the billowy clouds.

"That will take them a while," she added, due to the hologram on the outside of legal copies of the Windows 95 box and the certificate of authenticity inside.

Santucci estimated that Microsoft's overall revenue would be double without software piracy and counterfeiting. That means Microsoft has lost about $1.75 billion this year to pirates, based on recent revenue numbers.

It also means Microsoft has lost about $300 million in counterfeit sales of Windows 95 in the past month, based on sales estimates from PC Data in Reston, Va.

But Microsoft is not the only target. The BSA estimates that companies around the world lost $15.2 billion in revenue to software piracy last year.

And while software developers lose their profits, so do the legal retailers of products such as Windows 95. For example, one licensed Microsoft outlet in Hong Kong sold only five copies of the genuine Windows 95 upgrade in the three weeks following its launch.



Some complaints have arisen overseas that prices for Windows 95 are too high, making the counterfeit products all the more attractive. The Windows 95 upgrade costs about $103 in Hong Kong and $206 in Singapore, compared with $89 in the U.S., though many of these retailers are now charging U.S. prices for the product.

But Santucci disagreed that the overseas versions were overpriced, noting that the cost of localizing the software for a particular language is the only reason the prices are a bit higher.

"There should be no correlation between price of the software and whether it is pirated," she remarked.

Microsoft has bolstered its support efforts for overseas users so they see the benefit of buying original software. Santucci pointed out that users buying pirated copies of Windows 95 aren't eligible for product support or upgrades and may fall victim to viruses in the pirated disks.

Enforcement of copyright laws against counterfeit software is lacking in many countries, however. In Hong Kong, pirates are fined a nominal fee and are back in business the next day, while many times they are tipped off about customs raids and can close down operations before they are nabbed.

Portions of this story were drawn from IDG News Service reports.

Bell Atlantic is the latest to join the ranks of Win 95 outsourcers. See page 39.

Fore Systems plots ATM path

By Bob Wallace

Having laid the foundation for Asynchronous Transfer Mode (ATM) networks with a variety of switches, Fore Systems, Inc. last week spelled out its plans for software-based functionality that will let users build on the high-speed base.

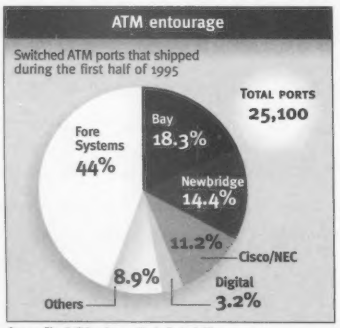
Fore Systems executives said the company is developing several major releases of its ForeThought software, due sometime next year. The releases will give users the enhancements needed to improve their ATM networks.

Key to the big picture view of these capabilities is ForeView, a set of Fore-developed management applications that enable users to set policies — or privileges — for security, routing and/or billing.

ForeThought software will be built into Fore-developed products, from the vendor's PC adapter cards to its highest-end ATM backbone switch. The features include support for distributed routing, virtual LANs that are created using different criteria and applications services that let users make sure that applications get the capacity and performance they need.

"Building an ATM network has gone far beyond physical layer connectivity, so network managers are looking for ways to increase the performance and manageability of their nets," said Skip MacAskill, a senior research analyst at Gartner Group, Inc. in Stamford, Conn. "Fore's giving them the functionality that users can parlay into robust ATM networks."

"We like where Fore is headed with ATM," said Bill Berry, a senior staff planner and designer/systems analyst at Amoco Corp. Berry is a member of the group that made the oil company's ATM demonstration network a reality. "They're looking at all the [functionality] that we're interested in," he said.



Source: The Dell'Oro Group, Menlo Park, Calif.

Still, Fore faces competition from companies that aren't as well-versed in ATM but have more experience with legacy LAN systems, MacAskill added. "I'd say that this area is still a level playing field," he said.

The many releases of ForeThought software will support these capabilities:

- Virtual LAN services. They give network administrators the ability to build logical rather than physical networks. Previously, the end user's location determined his subnetwork assignment.
- Distributed routing services. By moving core routing functionality into ATM switches, routers can be pushed out to the periphery of the network but not eliminated.
- Application services. This set of services enables network administrators to apply quality-of-service parameters to applications for best performance.

As ATM expands, Fast Ethernet retrenches. See page 73.

Software utility links NT, NetWare

By Laura DiDio

Microsoft Corp. last week released a software utility that lets its Windows NT Server 3.51 function as a NetWare 3.x-compatible file and print server.

The Windows NT Server 3.51 NetWare File and Print Services (FPNW) utility mimics the look and feel of the older NetWare environment but doesn't require that businesses make changes to their client PCs, said Mike Nash, Microsoft's group product manager for Windows NT products.

Windows NT

Gift from heaven

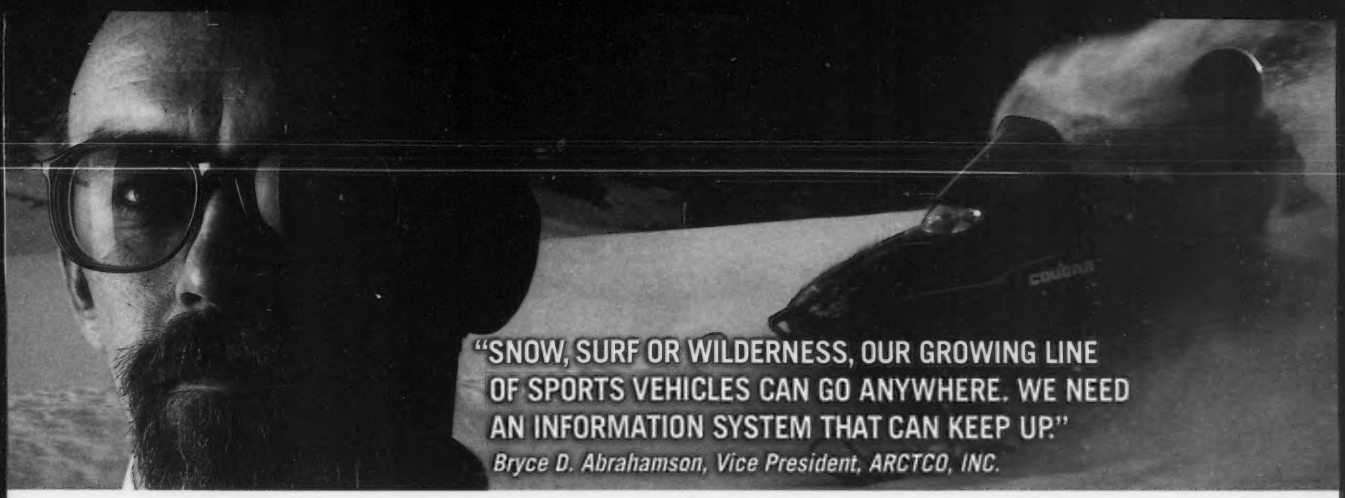
Beta user Deborah Mohr, an independent systems integrator at the General Services Administration (GSA) in Washington, said the FPNW software utility is a godsend for the government agency. It has extended the life of the current crop of NetWare 3.x LANs and Windows 3.11 operating systems, she explained.

"FPNW required no changes to our current desktop and network operating system configurations," Mohr said. "It also provides the GSA with fast and easy integration and coexistence between Windows NT Servers and Novell 3.x file servers."

Besides giving Windows NT Server users access to basic NetWare file and print services, the FPNW utility also lets users access their database server applications from the Windows NT Server environment, Nash added.

Microsoft's latest utility for the NetWare environment is another attempt by the company to ease migration to Windows NT Server 3.51 instead of upgrading to NetWare 4.1, according to analysts.

The FPNW utility is available now. It is priced at $99.95 per server license. Customers also must purchase a Windows NT Server client access license for $28.50.



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To receive the complete Arctco story, call Btrieve Technologies, winner of the 1995 RealWare Award at DB/Expo. 800-BTRIEVE, or (512)794-1719, CompuServe [GO BTRIEVE].

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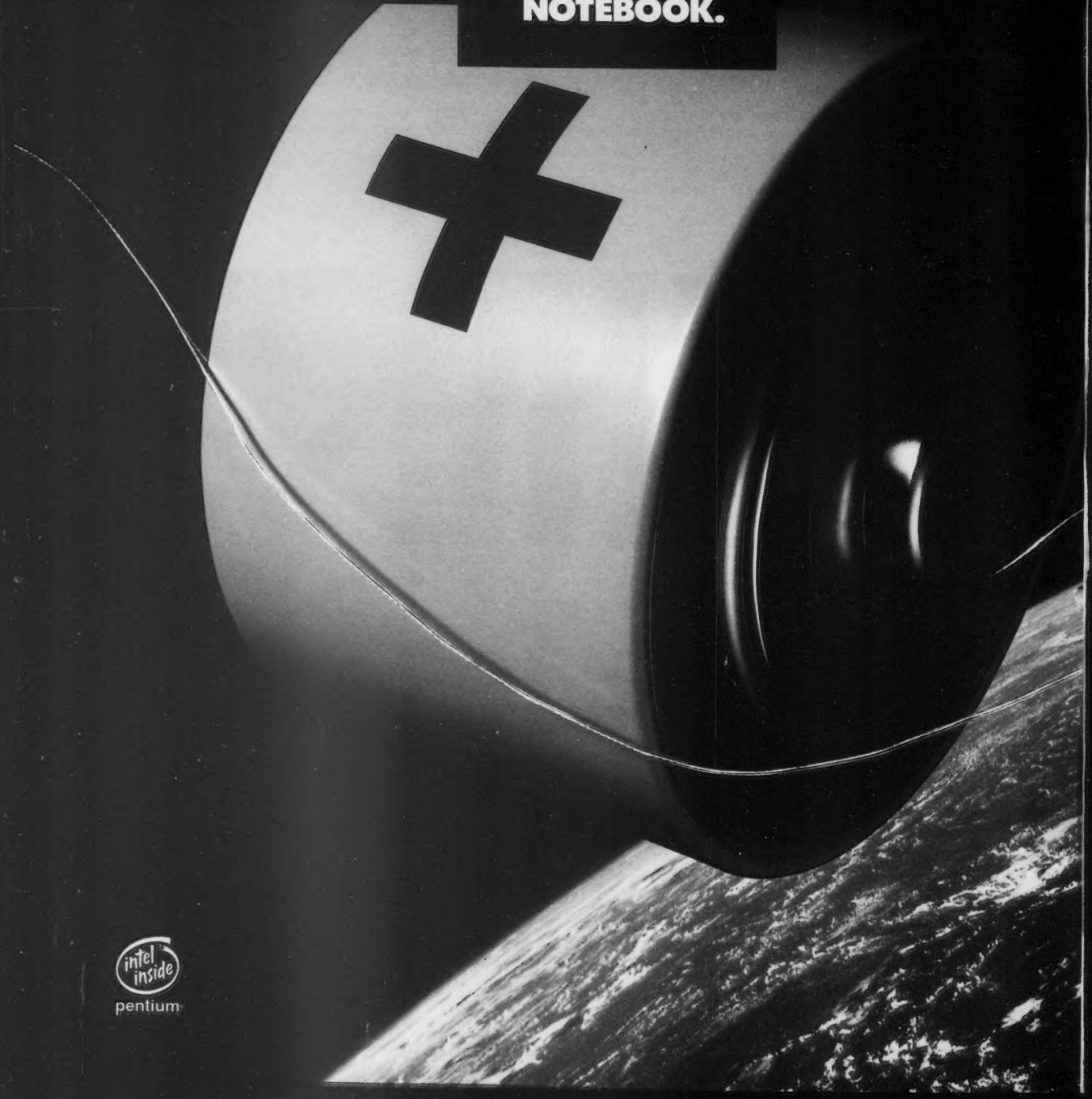
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Computer Industry

Arbiter's ruling fails to settle encryption patent dispute

By Gary H. Anthes

An arbiter's ruling in a bitter fight over who owns the technology used in most popular encryption programs last week left both sides claiming victory and customers confused, even as the ruling set the stage for a struggle over their hearts and pocketbooks.

But first is the issue of who actually won the dispute over the key patents that define public-key cryptography. RSA Data Security, Inc. and Cylink Corp. license the technology to hundreds of software vendors, and thousands of end users use it to ensure the confidentiality, authenticity and integrity of data files and messages.

Further legal action in the case seems assured. In the meantime, the rights and obligations of the companies' customers are mired in the legal intricacies of patent law and the technical arcana of encryption.

The two rivals were once joined in a partnership called Public Key Partners (PKP), which they formed in 1990 to establish security standards to license to software vendors. But the relationship deteriorated as the companies fought over their respective patent rights and the revenue derived from them.

Last year, Cylink went to an arbitration panel with its argument that RSA had exceeded its rights under the PKP agreement. Sept. 6, the panel dissolved the partnership and issued a number of rulings on the patent issues — some apparently in RSA's favor, others in Cylink's — leaving neither company a clear winner.

The result was dueling press releases from RSA in Redwood City, Calif., and Cylink in Sunnyvale, Calif., each claiming vindication.

"Cylink wins lawsuit over patent dispute with RSA," proclaimed the headline on one release. "That's absolutely a lie," responded Kurt Stammberger, marketing manager at RSA.

The arbiter's ruling is binding, but RSA last week sought to render Cylink's claims meaningless by asking a federal court to invalidate the patents on which Cylink is staking its claims.

In any case, RSA, which holds the lion's share of the encryption software market, said it was undeterred by the panel's findings. "RSA will continue to conduct its software business in exactly the same way that it has for the past 10 years," said RSA president Jim Bidzos.

But Cylink said RSA licensees must now come to Cylink for licenses or risk legal action. "We don't want to create a dispute with 100 other companies [over] the errors of their supplier in the past," said Bob Faugner, general counsel for Cylink. "Unfortunately, we may have to single out somebody to prove the point."

Unlike RSA, which licenses public-key encryption technology on a per-copy basis, Cylink said it will sell software vendors the right to make unlimited copies for a flat fee of $50,000.

Last week, NetManage, Inc. in Cupertino, Calif., said it would license public-key cryptography from Cylink.

And Cisco Systems, Inc. in San Jose, Calif., said its plan to add Cylink-based cryptography to its routers next year wouldn't be affected by the ruling. "I think from a customer standpoint, this is the best thing that could happen to public-key encryption," said Matt Howard, Cisco's security products manager.

CYLINK

"The panel's decision vindicates our position that RSA Security, Inc. has been improperly licensing technology which they did not have the necessary rights to."

RSA

"Cylink lost every single significant issue in the arbitration. Their press release was simply an attempt to cover up what has been a crushing defeat."

Companies are coming to terms with the need for E-mail security. See page 53.

Token Ring switching market set to explode

By Bob Wallace

Networking vendors have been racing Token Ring switches into the market with the same determination that baseball teams race for the final wild card playoff slots.

A prime example was last week's agreement between networking heavyweight Bay Networks, Inc. and IBM under which the two will resell each other's products in a bid to fortify their beachhead in the nascent market.

That deal follows a fast-growing list of similar moves, including a deal between Cisco Systems, Inc. and Madge Networks, Inc. and, separately, between Cabletron Systems, Inc. and Nashoba Networks, Inc., over the past six months. Driving the trend is the fact that Token Ring networks have finally caught up to Ethernet in one key way — running out of bandwidth. A wave of Ethernet switches hit the market a year ago.

User benefits

Meanwhile, the payoff for Token Ring users is expected to be lower prices — as much as 25% to 35% lower. "I think it's safe for users to expect those prices to drop as more vendors begin volume shipments of Token Ring switching products," said Daniel Briere, president of TeleChoice, Inc., a Verona, N.J., consultancy. "The ultimate winner in all this is the user, who didn't have choices in this market until under a year ago."

Vendors see a huge emerging market for Token Ring switches, and Standard Microsystems Corp. and Bay Networks are the only established players. As was the case with Ethernet switching, there's room for many more players.

Bandwidth bottlenecks

Token Ring switches enable network managers to provide end users on overcrowded 4M or 16M bit/sec. shared-capacity LANs with their own personal 4M or 16M bit/sec. of bandwidth.

On the flip side, if dedicated 4M or 16M bit/sec. is overkill for end users, network managers can use the switch to break one large Token Ring into several smaller rings.

That is the case with Centillion user the Baptist Foundation in Phoenix.

"We had roughly 300 end users on our [Token] Ring, and performance was suffering," said Harry Gentner, systems manager at the foundation. "So we used the switch to break that ring into six smaller ones and roughly doubled performance. That's important because we're expanding like heck and need flexibility."

"There's no rocket science here, rather its Business 101," Briere said. "A wide group of vendors have noticed pent-up demand for Token Ring switching and are doing whatever it takes to deliver products to market."

Because it is a fledgling market and many vendors are not yet shipping Token Ring switching products, analysts from the Dell'Oro Group in Menlo Park, Calif., estimate that only 3,000 ports of Token Ring switches were shipped in the first half of this year. That's up from 1,000 in the second half of 1994, according to Dell'Oro, which tracks the LAN switching market.

As far as pricing is concerned, IBM charges users roughly $600 per port for its 8272 Nways workgroup switch, which will be generally available in November, according to an IBM spokesman.

For backbone use, Centillion, which is run as an independent business unit of Bay Networks, charges roughly $2,000 per port for its Centillion 100 LAN switch. It can be configured to support up to 24 switched Token Ring ports.

Moving the market

Vendors have made the following moves to bring Token Ring switching products to market:

- Start-up Xylan announced in the summer of 1994 plans for a LAN switch that supports Token Ring switching.
- Start-up Centillion Networks last November began shipping a switch that could be equipped with Token Ring switching modules.
- IBM announced plans for the 8272 Nways Token Ring workgroup switch, which can be configured to support up to 12 ports. It's due out in November.
- Cisco Systems teamed up early this year with networking power Madge Networks. Cisco is reselling Madge's RingRunner Token Ring switch.
- Cabletron Systems formed an alliance to resell the products of start-up Nashoba Network.
- In May, Bay Networks acquired Centillion for roughly $140 million.

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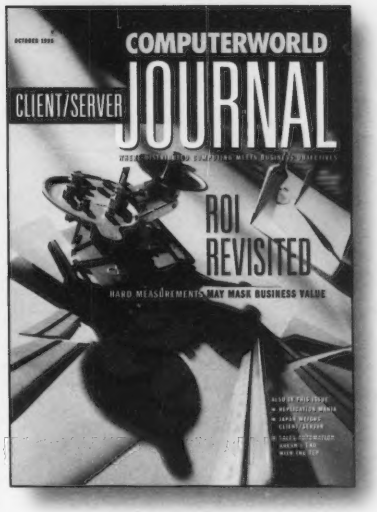
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Don't miss the October and November issues of Computerworld Client/Server Journal.

October Issue



Cover Story: Measuring ROI for Client/Server

How are companies examining their return on client/server investments? Can it really be measured in hard dollar terms?

Product Focus: Database Tools

Firing Line compares ODBC drivers — Intersolv's DataDirect and Visigenic's ODBC DriverSets.

Test Drive focuses on market leading query tools.

Careers Column: Grooming technical managers for project management.

November Issue

Ad Close: September 27

Cover Story: The Shakeout in Application Development

What's in store for users and vendors as the application development market changes and consolidates.

Vertical Market Focus: Brokerages

A look at how brokerages and investment banks are using client/server technology to manage their risks, and deploying this technology to help develop and manage new derivatives products.

Product Focus: Application Development Tools

Our Firing Line feature takes a look at Forte 2.0.

Careers Column: A former Cobol programmer relates the process of switching to a career in Notes development/administration.

COMPUTERWORLD CLIENT/SERVER JOURNAL

WHERE DISTRIBUTED COMPUTING MEETS BUSINESS OBJECTIVES

Long-distance race

Forget about all those 10,000-word analyses you skimmed last week trying to decipher what the self-inflicted slicing and dicing of AT&T means to you. I'll explain it all.

AT&T is going back to the roots its executives surely wish it had never left in the first place, and that is communications, communications equipment and communications services. You can see the operative word here. It isn't "computer."

This will unquestionably generate very positive benefits for business communications users. Congress is almost certain to pass laws that will largely deregulate the rest of the industry.

The result? The Baby Bells, many of which will never be accused of being innovative, will face real competition from AT&T and maybe others. We all know what happens next. The providers are forced to become more efficient and more creative. Prices fall. The menu of services grows. Poor performers wither. The strong thrive.



And the customer, especially the big-business customer, reaps huge benefits. Specifically, AT&T will push very hard for dominance in the cellular and remote communications area with the same lower-cost, enhanced-services strategy. On-line services provided through the major carriers will also see a boost once real competition kicks in.

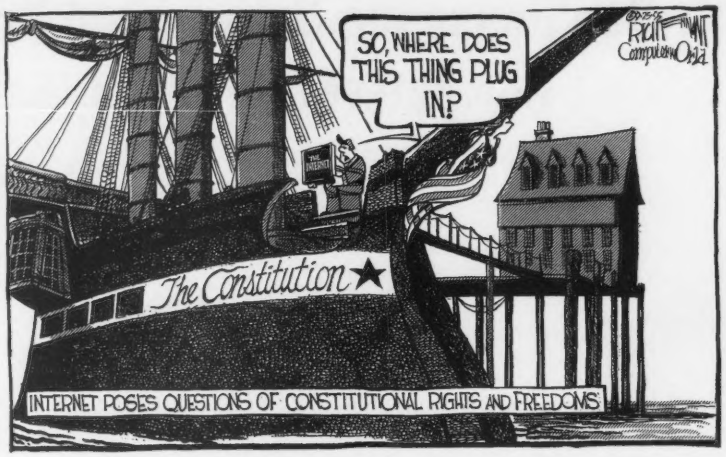
Now, if you are a big customer of AT&T's soon-to-be-orphaned AT&T GIS computer division, the former NCR, the future is not clear at all. The marriage of AT&T and NCR was doomed before the vows were exchanged, as neither the executives and workers at NCR nor their customers wanted it to happen. Bad start, predictable results.

The computer unit will slash costs, but it has to convince customers it will be around for the long haul because it sells serious business machines, namely midrange and high-end servers. This was the battle fought, mostly unsuccessfully, by Wang, Data General, Prime and others a few years back. They emerged as shells of their former beings, recast as very different companies or bankrupt.

It would be a pity to see the NCR legacy fade into history. I don't believe that will happen. But clearly there are very rough times ahead for what will remain of AT&T's computer unit.

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: *bill_laberis@cw.com*



Tabs are tops

Thank you, thank you, thank you for the new page numbering system at the top corner of the page. I am a heavy user of indexes, and it's a real time saver for me.

It would be even better if you also put the page number box at the bottom corner of the page.

And when you put page numbers on advertisers' pages, I will pinch myself to see if I'm dreaming.

Phil Trott
San Luis Obispo, Calif.
ptrott@main.slocs.k12.ca.us

Watch for wrong 'word terms'

In "Sex, suicide and virtual reality" [CW, Sept. 11], Joe Maglitta used a phrase that automatically lowers my technical opinion of *Computerworld*. He refers to an application as a software program.

The phrase software program, which translates into either software software or program program, has been adopted readily by technical writers who don't know their field but want to sound up to date.

I would advise your "reporter writers" to sit down at their "word processor computers" and remedy these little "bug glitches" before they drive home for the evening in their "automobile cars."

Daniel J. Pacek
Jefferson, Mass.

Argument against OS/2 illogical

J. Briscoe Stephens needs to lighten up and start using logic more than emotion ["Will Win 95 kill OS/2?" CW, Aug. 28].

He bashes IBM on its management and marketing strategies, but that was not the premise for the article. Nor did he have solid arguments for why OS/2 should be going away.

I use OS/2 Warp, and I have used and researched Windows 95. OS/2 Warp is gaining strength slowly but surely.

Mike Anzis at least approached the topic from a reasonable standpoint — how many J. Briscoe Stephens is comparing apples to rutabagas in his "interoperability" argument. He complains that OS/2 programs will not run under AIX but that Microsoft's Windows 3.1, Windows 3.11, Windows NT and Windows 95 programs run equally well with each Windows product. I have a Windows 3.1 program that has problems running under Windows 3.11! And what Windows program will run under AIX? If OS/2 doesn't live, it won't be because of this argument.

Charles B. Chapman
Environmental Services
London, Ontario
CCHAPMAN@city.london.on.ca

Frost bite

Jeffrey Frost starts an Internet firm with a peculiar market niche, brings on 70 customers and hires a staff ["My cybermall went cybersplat," CW, Aug. 7]. Then he dumps the staff, dumps the customers, immediately starts a new Internet firm and publishes an article that proposes to advise the rest of us on Internet marketing!

I can't take his advice seriously — and I'm not hopeful about the future of his new firm.

Isaac Malitz
Los Angeles
malitzi@pronex.com

More letters, *page 36*

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Verbatim

FROM THE SEPTEMBER ISSUE OF *IEEE Spectrum*, IN WHICH INTERNET GURUS DISCUSS THE SHORTAGE OF INTERNET PROTOCOL (IP) ADDRESSES:

Haruhisa Ishida: The Chinese would eventually like to have 1 billion IP addresses.

Christian Huitema: In five years, it won't be just 200 million computers [on the Internet] but something like several billion, and the current addressing technique is inadequate for that.

Stephen E. Deering: It seems quite reasonable to imagine whole new classes of devices getting on the Internet — power meters, automobiles, set-top boxes, your stereo, your refrigerator, burglar alarm and so on.

Huitema: And pacemakers.

Vinton G. Cerf: And your toaster, which is already integrated.

Eric Schmidt: So when do we run out, Steve?

Deering: I currently say 2010, plus or minus 10 years. A little flattening of the exponential growth curve through better address-management gave us a lot more years, but the introduction of new classes of devices can change that quickly.

FROM THE "TELECOMMUNICATIONS TECHNOLOGY AND NATIVE AMERICANS" REPORT BY THE U.S. CONGRESS' OFFICE OF TECHNOLOGY ASSESSMENT:

New telecommunications technology — Internet, electronic mail, compact discs and digital telephones — offers Native Americans opportunities to strengthen their society. However, the failure of Native Americans, collectively, to gain a better understanding and control of this technology could further undermine their culture, community, sovereignty and self-determination.

Absent policy interventions, Native Americans are unlikely to catch up with, and probably will fall further behind, the majority society with respect to telecommunications.

Cruising www.us.route.66

Chris Miksanek



Trash the old information superhighway cliches. Here's a new batch for the 'net lexicon.

Headline writers and advertising directors are quick to overuse hackneyed information superhighway expressions. Who among us can contain a groan when inflicted with yet another iteration such as "The On-Ramp to the Information Superhighway" or the "Fast Lane of the Information Superhighway" or the pitifully lame "infobahn."

Don't misunderstand; navigating this complex network is problematic, and explaining it certainly is more effective with metaphors. But let's stop rehashing the same pathetic expressions. Surely there must be fresh, original descriptions of the superhighway's commuters, their attributes and some of the system's navigation problems. The following are some additions to the information-highway vernacular:

Driving on the shoulder. Apprehensively traversing the information superhighway. These drivers are intimidated by terms such as file transfer protocol (FTP), Telnet, World Wide Web and Usenet. They are content to limit their excursion to electronic mail, or the "frontage road" as it is known in superhighway circles. Their credo: If God had intended us to travel the information superhighway, we would have been born with PCMCIA slots.

The scenic route. Taking the long way to an Internet site. Generally used by males because real men don't stop and ask questions. They just click their way around, bouncing off various keywords. Check the frequently asked questions (FAQ) file? We don't need no stinkin' FAQ file. Hey, half the thrill of getting somewhere is the ride.

Backseat driving. Looking over someone's shoulder, telling them what to type and hollering when they repeatedly mistype a Web address. Often heard accusing a purposeful fat-fingered colleague of...

Driving like an old lady. Navigating slowly through the Internet by reading the entire Web page or read.me.first document before proceeding, rather than speed-reading and clicking like a lunatic on any hot links that look interesting. At the other end of the spectrum is the commuter who is...

Driving like a maniac. Refers to the hot-key, bookmark and shortcut crowd. No scenic driving for them. They know where to go and how to get there quickly. They often race against others of their breed to see who can access a particular Web page or FTP site faster. They tend to be backseat drivers, easily annoyed by users who drive like old ladies.

Superhighway cruisers. In another era, they would have been *American Graffiti* candidates, one arm on their babe and another on their mouse. It doesn't matter if their machine is a fast new Pentium or an old 286 beater. (Cruiser giveaway: Look for the terminal with the fuzzy dice wallpaper and the Beach Boys' "Little Deuce Coupe" as the start-up sound.)

Road warriors. These folks are so immersed in Internet culture that they express everything in terms of their domain. They state their "voice telecom ID" in the format 708.555.1212 and their "biological ID" in the format John_Smith. What does a road warrior do when he can't find his keys in his suit jacket? He phones the spouse at home and asks her to "check alt.jacket."

Information supertollway. What will happen when universities and the federal government relinquish control of the Internet to private industries.

Miksanek is a programmer at a software company in Rochester, Minn. He cruises the information superhighway with a St. Christopher statue on his terminal.

Save the FCC, for your sake

Edward Warner



In a world of monopolies and oligopolies, the FCC can be a network manager's ally.

There is talk in Washington about doing away with government agencies such as the Commerce and Energy departments. If the trend continues, we may end up with but two agencies: the Department of Defense and the Internal Revenue Service to pay for it.

The latest agency proposed for the chopping block is one near and dear to my paycheck, if not my heart. It is the Federal Communications Commission.

The continued vitality of this often-reviled agency also should be important to corporate information managers, since you've got to watch the cost of that information traveling via long-distance phone lines, T3 lines, VSAT links or whatever. The FCC is an important ally of yours, relatively speaking, because many telecommunications carriers are actual or virtual monopolies.

The siren song of those who want to do away with the FCC is seductive: The law creating the commission was enacted in 1934, when the nation's telephone system was a monopoly. Competing services were just a gleam on the screen of Dick Tracy's wristwatch.

Things are different today. There are competing access providers, including MFS Communications Co., which mainly serves large businesses and urban areas. There are more than 500 long-distance carriers, although most are resellers of the Big Three's services (whose lock-step price hikes look an awful lot like those of an oligopoly).

There is the promise of telephony competition in this year's congressional telecommunications reform bills, and a measure of such competition today in long-distance service. But combine local- and long-distance telephony — which happens any time you make a long-distance call — and you get a call that costs almost twice what it should.

The FCC caps the price that large telephone companies charge for that local hop. The agency recently reset that cap so long-distance carriers, and presumably their customers, will save about $1 billion a year.

Someday, long-distance carriers will be able to choose who provides that local hop. It could be wireless carriers or cable TV companies running a telephone network on top of their video. Until then, you need the FCC.

Those who want to do away with the FCC say that whenever competition fails to self-regulate a market, you can always take your complaint to court. Right. And get in line. While the FCC is often faulted for foot-dragging, it is positively fleet compared with the glacial court docket.

Corporate users have advocacy groups, such as the International Communications Association, that file comments with the FCC. Will a judge have the time or inclination to hear their pleas for rate fairness? The issues are too complex and the docket too crowded with bigger controversies.

Sure, we can do away with the FCC, and there will be a short-term gain most people will cheer: Lawyers and telecom industry reporters will be laid off. The lawyers will find other work in the resulting cases that will clog the court dockets. And the journalists will likely end up doing public relations for the monopolies that, unleashed, will eat competitors whole.

But who will represent your interests when this telecommunications bill comes due?

Warner edits "FCC Report" in Alexandria, Va. His Internet address is ewarner@cappubs.com.

Review of OS/2 vs. Win 95 flawed

I am astonished that a respected computer publication would print this so-called "review" ["Win 95 bests OS/2 Warp" CW, Sept. 11]. In particular, OS/2 has supported long file names since Version 1.2 was introduced in September 1989.

In the areas of fault management and multitasking, there's no comparison between OS/2's ability to pre-emptively multitask, protect 16-bit Windows applications and its native applications and Windows 95's cooperative multitasking and complete lack of protection. The author fails to note when he touts these as benefits of Windows 95 that they apply only to new native Windows 95 applications and not existing ones.

Peter Flass
Systems programmer — Team OS/2
New York State Legislative Bill Drafting Commission
Albany, N.Y.

How can you expect people to rely on your newspaper for truthful and accurate comparisons when it is obvious that your review didn't tell the truth? OS/2 Warp doesn't support long file names. What!?! Read any marketing material about OS/2 Warp, and it is obvious that you were either lying or intentionally misleading people. I won't renew my subscription to *Computerworld*. I can only hope that I haven't been misled or lied to in the past by your newspaper.

Troy Sparks
troy.sparks@medtronic.com

The right move

While the mistake was rather large, I am more appreciative of your prompt reply to the OS/2 community [in the comp.os.os2. advocacy newsgroup] than you can imagine. Not many publications would make such an admission of error. Thanks for doing the right thing.

Larry Salomon Jr.
Bellerose, N.Y.

My new Sept. 18 issue showed up Tuesday. I thought the overall presentation of your response on the OS/2 issue was most gracious and likely to enhance your credibility — over the long term anyway.

Ron Shannon
Santa Cruz, Calif.

You were incorrect when you wrote "Windows 95 supports the use of long file names; OS/2 doesn't." Warp's HPFS file system certainly does support long file names and is much better than [DOS'] file allocation table many ways.

You were incorrect when you said OS/2 can't multitask DOS sessions without slowing significantly. Warp can pre-emptively multitask DOS and 16-bit Windows applications just fine.

These glaring errors of yours cast suspicion on the objectivity and reliability of the rest of the article. Any comparison that uses a single DOS game to evaluate DOS compatibility can't really be a serious comparison. I expect better from *Computerworld*.

Dave Abercrombie
abe@netcom.com

Your reviewer writes, "The fault management system is the best I have seen yet in a PC operating system." Is he kidding? Even Microsoft says that if you are running mission-critical software, don't run Windows 95. Windows 95 has some design compromises that make it less stable then both OS/2 and Windows NT, and Microsoft has admitted this. *Computerworld* should be embarrassed about printing such a poorly researched and erroneous review.

Ari Shapiro
Flushing, N.Y.

Your statement about long file names is misleading and only true if OS/2 is installed using the file allocation table file system. When installed with the High Performance File System, file names may be up to 256 characters. This feature of OS/2 has been touted in advertisements at least as far back as OS/2 2.0.

Your reviewer said as a result of evaluating the two operating systems, he derived a list of features and then ranked each operating system. I would be less wary if he had developed a list of features, independent of either operating system, and then evaluated each operating system feature by feature. I can have little confidence in your evaluation.

Eric D. Sack
Cumberland, Md.
102053.1210@compuserve.com

If I were to tell my managers that I wanted Windows NT because it played games better than some other operating system, I would have been pummeled with an old XT.

— Michael D. Norwick



Your statement about long file names is misleading and only true if OS/2 is installed using the file allocation table file system. When installed with the HPFS, file names may be up to 256 characters.

— Eric D. Sack

Your review sent me reeling. I have just talked my company, a Microsoft corporate customer, into setting up several desktop machines with Windows NT Workstation. My operating system of choice is OS/2, but it wasn't an option. If I were to tell my managers that I wanted NT because it played games better than some other operating system, I would have been pummeled with an old XT.

In the future, could you give us the benefit of a doubt before choosing guest reviewers? Some of us use computers to get real work done.

Michael D. Norwick
Goodhue, Minn.
miken@novalink.com

I am a computer systems engineer for one of the largest colleges in the country. And the amount of research that I have to do to present my point of view is substantial. I find the reviewer's statement "In an attempt to answer that question, I did what every information systems analyst should do . . ." comical.

"Windows 95 supports the use of long file names; OS/2 doesn't." Boot Windows 95 without the GUI and try to create a long file name. You can't.

"OS/2 also requires special steps for supporting hard drives larger that 528 bytes." We regularly install drives that are larger than 1G byte, and we even have 9G-byte drives on all of our Warp-based servers.

"DOS compatability — OS/2 failed on this one." OS/2 automatically detects screen mode changes and adjusts the window accordingly. There is even a setting in the DOS section to notify the application of any screen mode changes.

"It was a very easy process to overtask OS/2 and cause it to freeze." Windows 95 does indeed crash and leave the whole system useless. Just try running debug and entering "f 0:0 ffff 0" (fill memory locations 0:0 thru 0:fff with 0). There is *no* protection. OS/2 will recover gracefully.

Also, OS/2's First Failure Support Technology allows real-time reporting and logging of system errors. OS/2 also allows a full dump to be taken of system memory even after the OS/2 stops running.

Your pages have become a forum for Microsoft FUD (fear, uncertainty and doubt).

Ed Halbert
Computer Systems Engineer
Computing and Information Systems
Northern Virginia Community College
ehalbert@nvmusic.vccs.edu

I am a young college student who counts on information supplied by *Computerworld*. But this makes me wonder how many [inaccurate] articles I have read in past issues.

I have spent about the same amount of time with each operating system, and thus think I have an equal amount of experience with each. To go sequentially, problems I found with the article include the following:

1. Ease of use — To quote Mr. Trimble, "Creating a folder in OS/2 can be a challenge; the task is two clicks away in Windows 95." In fact, OS/2 is a mere drag and drop away from creating a folder anywhere.

2. Fault management — If you had the patience, you would realize OS/2 also allows you to terminate an ill-behaved application. You just have to wait while it is trying to recover it. OS/2 actually loads 16-bit Windows applications into individual virtual DOS machines, so OS/2 won't crash with an application. This protection isn't supported by Windows 95.

3. File system — The fact that Windows 95's file allocation table file system comes with utilities should give a hint [of its inferiority to HPFS]. "Windows 95 supports the use of long file names; OS/2 doesn't." *Wrong!* "OS/2 also requires some special steps for supporting hard drives larger than 528M bytes." *Wrong!* FAT is the one with that problem.

4. Windows 95 lacks pre-emptive multitasking with old 16-bit Windows applications. OS/2 will allow pre-emptive multitasking when 16-bit applications are running.

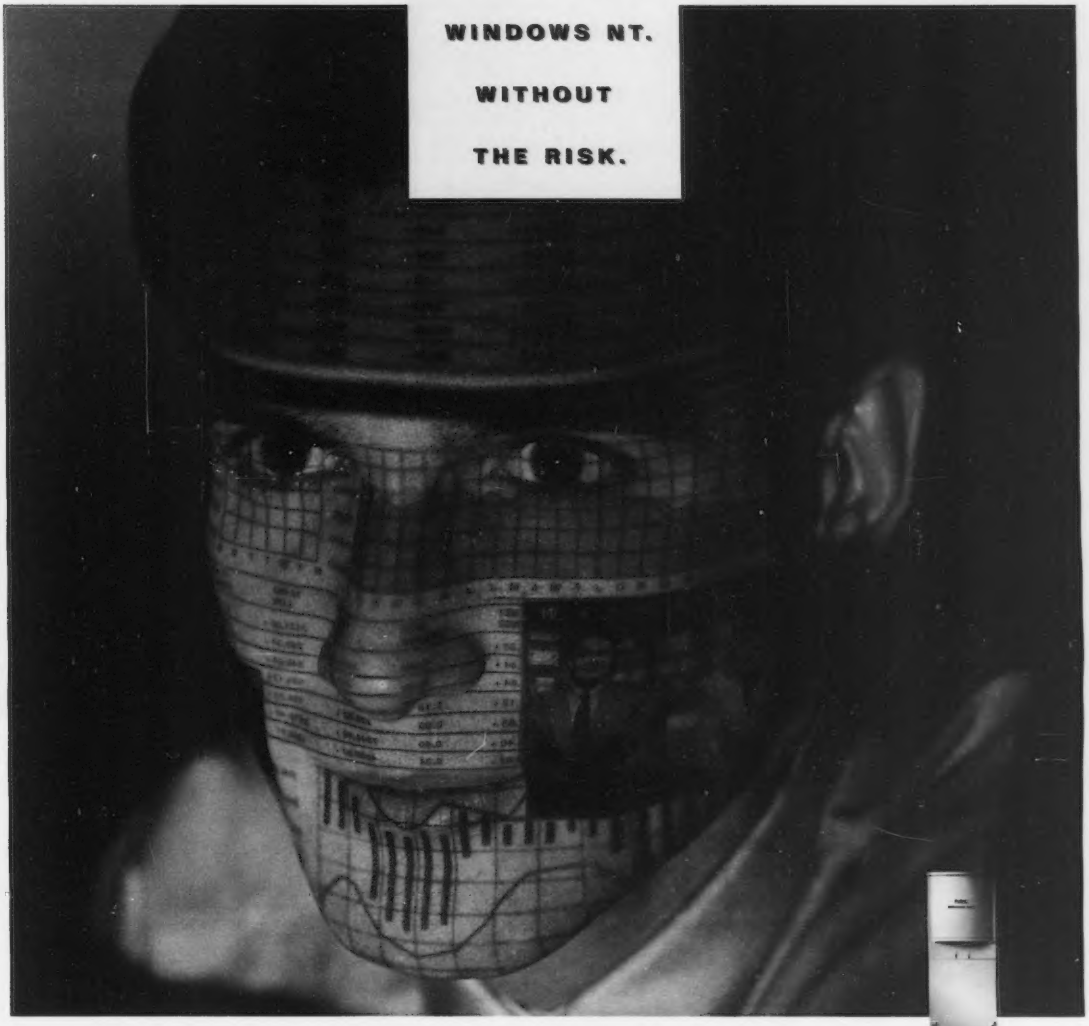
5. Windows support — If you are going to include Windows support in your comparison, you had better include OS/2 support, of which Windows 95 has zilch.

This is one of the most inaccurate articles I have ever read.

Aaron Diesen
Bozeman, Mont.
mudruckr@cs.montana.edu

In our product comparison, *Computerworld* failed to provide our reviewer with guidelines that would have resulted in a rigorous test of the two products. We were also sloppy in editing the results, not passing them by the right eyes for possible problems. The results were conclusions drawn about the products that we cannot support. Thus we will retest the products and provide a comprehensive product comparison of OS/2 Warp and Windows 95 later this fall. Also, as we were deluged with mail decrying the product comparison, we were subsequently flooded with mail thanking us for acknowledging the error and committing to redoing the review.

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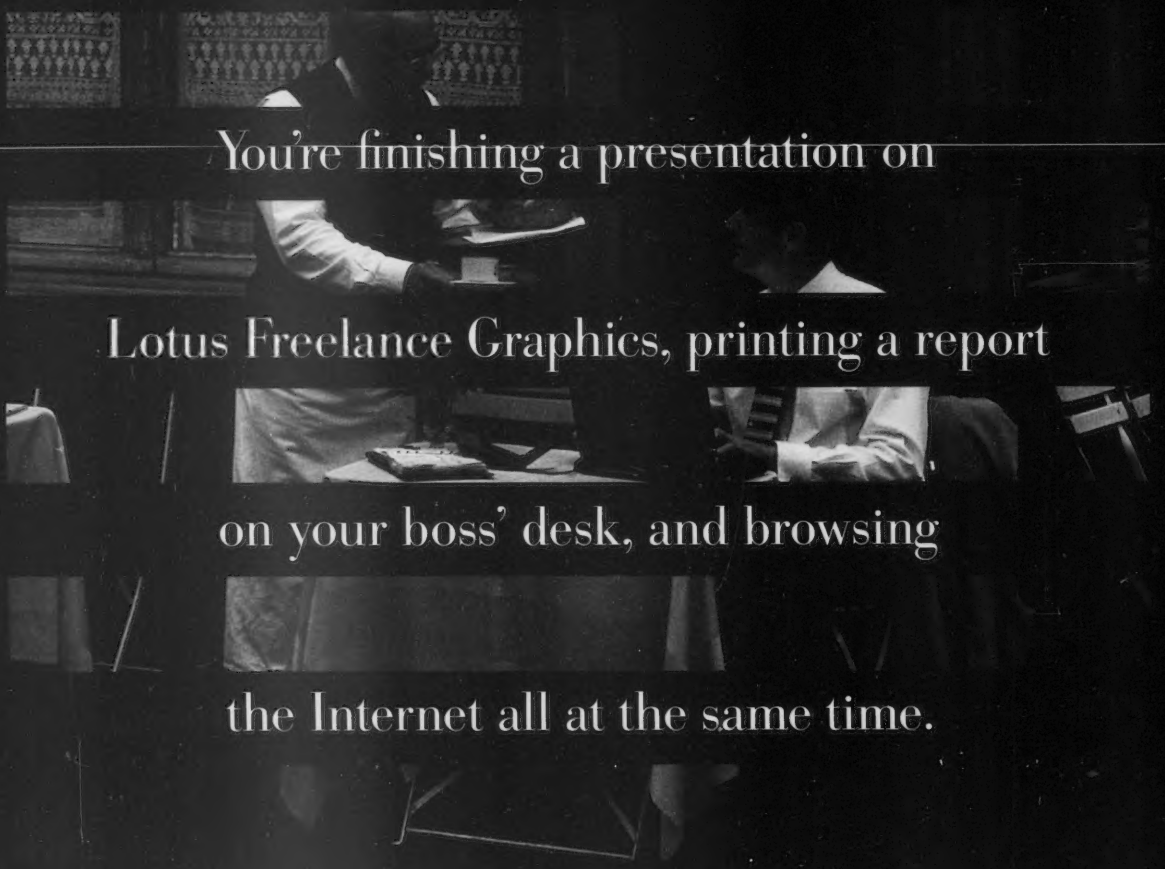


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PROBLEMS PLAGUE ACCELERATOR BOARDS, 41
YOUR HOME PC IS WHERE THE INNOVATION IS, 48

Desktop Computing
PCs AND SOFTWARE • PORTABLE COMPUTERS

Win 95 graphics make strides

Multithreading, price give Win 95 boost vs. Mac OS

By Cheryl Gerber

Windows 95 graphics software will give the Macintosh — long king of the graphics hill — a run for its money, users and analysts said.

They cited the ability to multithread in Microsoft Corp.'s Windows 95 but not yet in the Macintosh, and a perceived price advantage of the Windows platform.

"Any advantage the Macintosh had is gone. Windows 95 can do graphics as well or better, and the hardware is cheaper," said Tom Nelson, a storyboard artist at Warner Brothers Animation in Sherman Oaks, Calif.

Apple Computer, Inc. isn't sitting still, however. The Cupertino, Calif., company announced in August an across-the-board price cut that it claimed put its Power Macintosh in the same price range as comparable systems from IBM and Compaq Computer Corp. [CW, Aug. 14].

Nelson uses a Power Macintosh and is a beta tester of Micrografx, Inc.'s ABC Graphics Suite for Windows 95. He uses both environments to scan in drawings and digitally paint animation models. He said the multithreading inherent in Windows 95, which the 32-bit Mac OS doesn't have, is one of the advantages Windows 95 graphics have over the Macintosh.

For example, multithreading lets users simultaneously apply the same brightness control across 100 photographs. Without multithreading, this

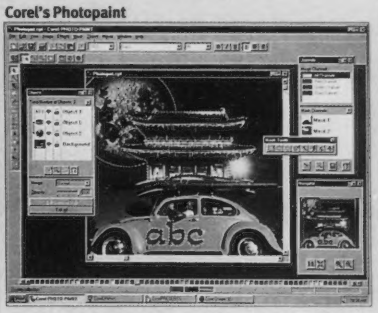
Win 95. vs. Mac OS, *page 42*

The power of pictures

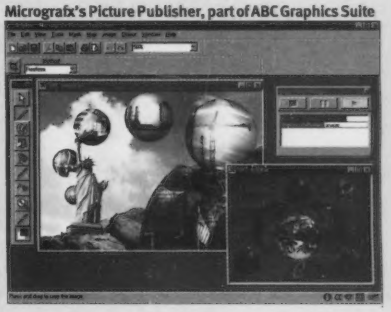
Adobe's Photoshop



Corel's Photopaint



Micrografx's Picture Publisher, part of ABC Graphics Suite



Windows 95 graphics packages *like the ones above are just the beginning, most observers said. Indeed, it's only a matter of time before Windows 95 makes 3-D graphics and holograms a reality on the desktop. Long a ferocious consumer of time and MIPS, 3-D software will now find a spacious home in the 32-bit operating environment. If the leading graphics vendors don't offer 3-D products soon, other vendors will happily snatch up the opportunity.*

Services abound for migration

By Stuart J. Johnston

Microsoft Corp.'s Windows 95 is triggering a boom in migration services for corporate users who want help getting through the process.

To date, more than a dozen major firms have announced Windows 95 migration services, including AT&T Global Information Solutions, Digital Equipment Corp., Electronic Data Systems Corp., Egghead Corp., Inacom Corp., VanStar Corp. and Stream International, Inc.

Windows 95 migration

Among the most recent to enter the fray is Bell Atlantic Corp.'s Business Systems Services unit in Frazer, Pa.

Bell Atlantic has trained 30 field engineers to provide Windows 95 migration services and plans to train another 100 by the end of the year, said Jim Howard, manager of network applications support at Bell Atlantic.

Indeed, many analysts predict that most corporations will not begin large-scale migration to Windows 95 until next year, a prediction that is echoed by corporate information systems managers.

When that day arrives, however, outsourcing the migra-

Windows 95 migration, *page 42*

Peripheral connections

Bus spec to ease use of external devices

By Jaikumar Vijayan

An industrywide initiative to simplify PC-to-peripheral and PC-to-telephony connections is expected to make the Universal Serial Bus a standard feature in PC chip sets by year's end and in desktop computers by early next year.

The USB specification is an effort to provide users with a standardized and hence easier way to connect external peripherals such as modems, printers, mice, joysticks, scanners and keyboards to PCs and notebook computers.

Despite signs of growing momentum, however, the standard interface is not expected to be widely implemented until mid-1996.

The effort is being spearheaded by a clutch of industry heavyweights, including Microsoft Corp., IBM, Digital Equipment Corp., Compaq Computer Corp., Intel Corp. and Northern Telecom, Inc.

Universal bus

WHAT IT IS:
USB is a simpler and more flexible way to connect devices to your desktop or notebook PC

WHAT IT DOES:
Detects and automatically configures external peripherals, such as modems, printers, mice, joysticks, scanners and keyboards, as soon as they are physically attached

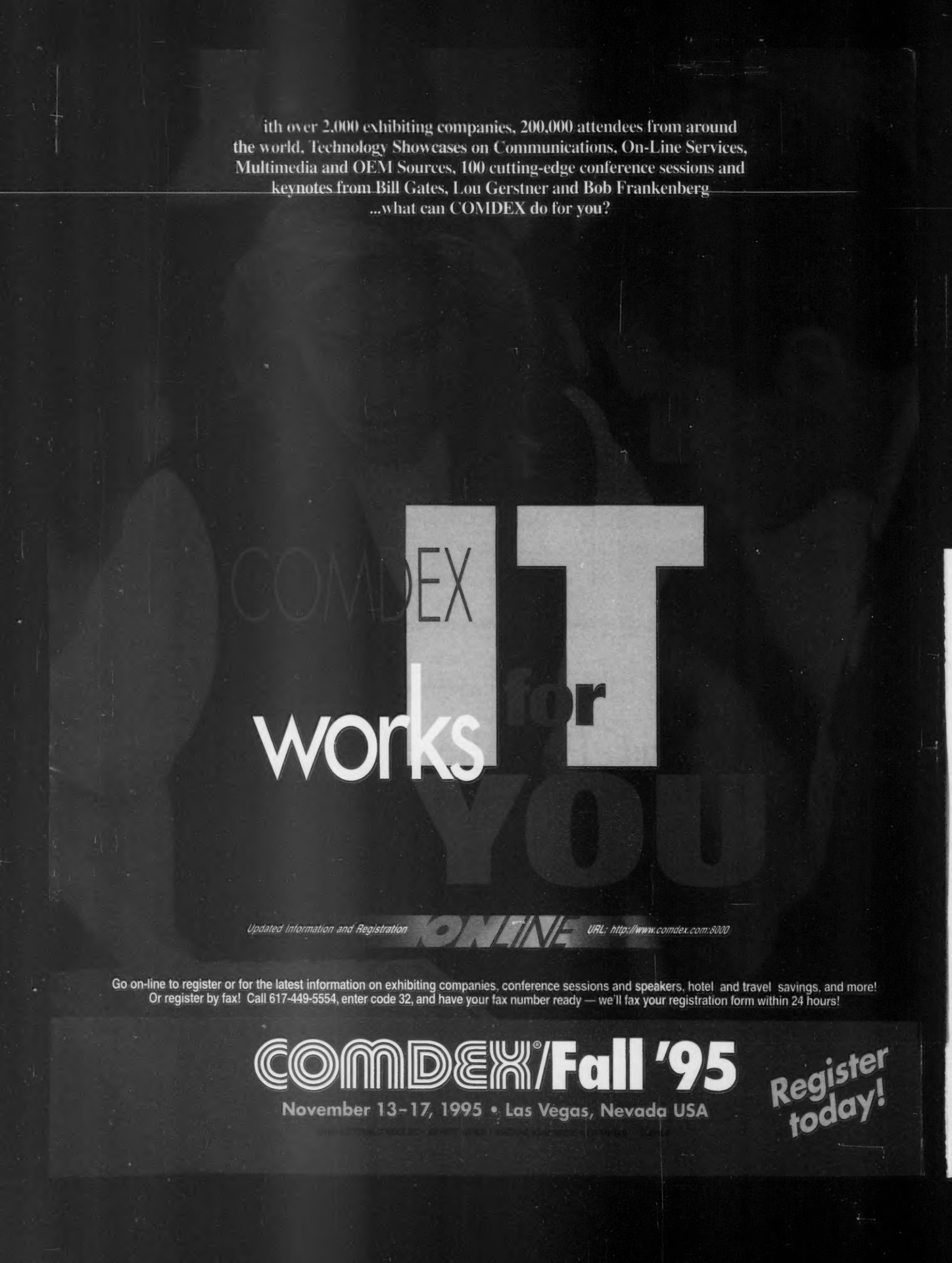
- Allows users to add and remove devices at any time without having to power down or reboot
- Enables easy PBX and digital telephone connectivity without specialized add-in cards
- Supports high-speed telephone trunk interfaces, such as ISDN or T1 lines
- Uses a single connector for all devices, so there is no way to plug it in wrong

A method to the madness

"The back of almost everybody's computers these days has all kinds of wire coming out that makes things very difficult from a cabling point of view. The USB ultimately will consolidate all of those connectors and cards into one [interface]," explained Robert Jackson, vice president of business relations at Compaq.

"Something like this definitely makes sense," said Steve Booth, a microcomputer analyst at Wisconsin Electric Power Co. in Milwaukee. "But vendors are going to have to make sure that they have very stringent specifications for the peripherals that get attached

Bus standard, *page 41*


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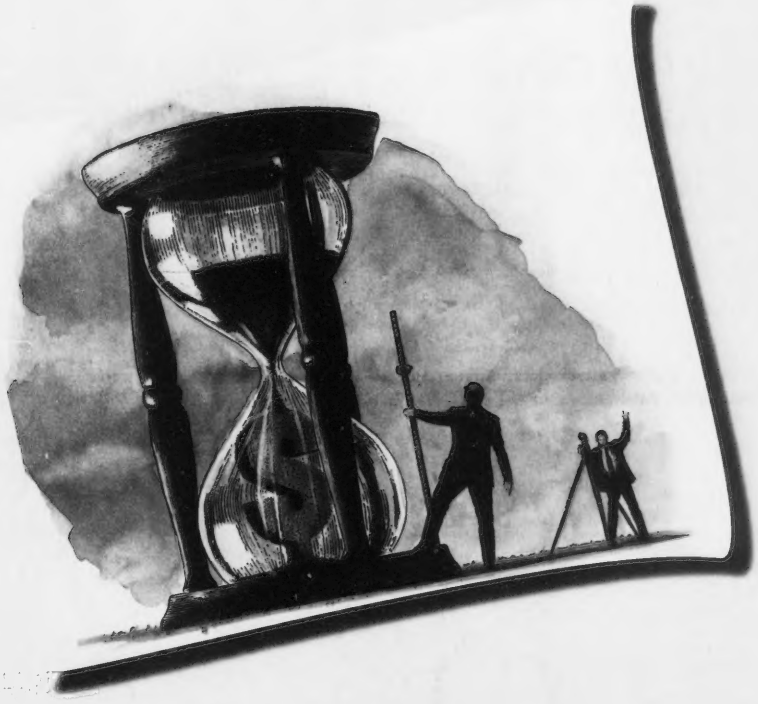
White Paper

September 25, 1995

SMR

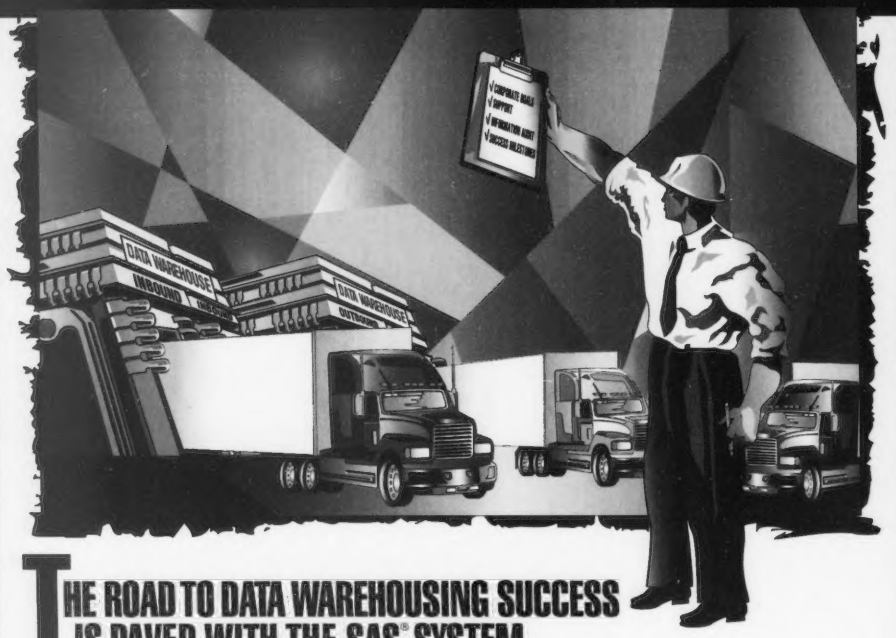
The Business Case for Client/Server

Part 3 of a 4-part series on Enterprise Software Directions



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Introduction



Can We Justify Client/Server?

Curtain 1: The computer industry has finally found the key to unlock the potential of computers. Client/server computing will bring together everything that's been done in computing for the past 20 years and enable companies to achieve long-hoped-for productivity, efficiency and business benefits.

Curtain 2: Client/server is the latest marketing creation of an industry so deep in hype it can't tell what's real from what isn't. Companies are spending millions on a computing model that is more complex, harder to implement and more difficult to justify than anything previous. When enough companies hit the wall, the backlash will make the brouhaha over CASE look like a kiddie tea party.

Which curtain would you pick? No. 1? No. 2? You wanna open both curtains a bit?

What is the essence of the business case for client/server? For years, the industry has struggled to demonstrate, in tangible ways that businesses would accept, the ROI from IT. Can the industry do a better job with client/server?

In this, the third installment of the Enterprise Software Directions series, we will explore the basic questions of client/server investment, return, expectations. Every company, agency, institution and individual wants to be able to demonstrate, in concrete terms, that the investments they are making in money, time and effort on information technology are paying off.

But adopters *and* suppliers of client/server are struggling with both the cost and return sides of the equation. Early expectations of cost savings have been difficult to realize due to unforeseen infrastructure spending requirements, soft dollar expenditures and project delays. Many IS professionals find themselves in the awkward role of trying to make things work in a hurry. On the business side, quantifying new returns has been elusive, particularly in such areas as measuring productivity gains from new activities that lack a benchmark.

Still, companies such as Chevy Chase Bank, Time Warner and Dr. Pepper, among others, are reporting gains via client/server. Many are willing to accept (for now) that not all benefits can be charted on a spreadsheet. They believe that IT has a basic influence on how we work, an effect hard to capture using traditional forms of measurement.

But measure we will. And as the industry continues to invest in client/server, adopters should demand proofs and justification for the technology they're investing in. We may not know the ultimate outcome of the client/server experiment, but a little business acumen will go a long way in bringing the hype down to earth.

This White Paper was produced under the direction of David R. Brousell, vice president and editorial director of Sentry Market Research. SMR, a division of Sentry Publishing Co., in Westborough, Mass., specializes in demand-side information technology research in application development, network management and systems management markets. The editorial team for this White Paper consisted of Elaine Appleton, David Cherenson, Emily Kay and Larry Marion. The cover illustration is by Christopher Bing.

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A Gut Feel and A Leap of Faith

Ed Tunstall is embarrassed, and he's willing to admit it. The executive director of information technology for drug maker Eli Lilly and Co. hasn't quantified the business benefits of any of the host of client/server applications developed for the company.

"We've never documented anything like that," Tunstall admits. "We have a gut feeling, but I have absolutely no data to give you. We're struggling with how to value our efforts."

He adds: "If I give you the same answer one or two years from now, I ought to be shot."

Lots of IS managers are scrambling to avoid a firing squad these days. IS organizations, consultants and market research firms worldwide are starting from scratch in a frantic struggle to clearly, accurately and consistently identify the costs, benefits and payback periods for client/server projects.

> Every client/server project at the bank is owned and managed by someone in a line of business. -- Steve Scullen, Bank of Boston

No wonder there's an urgency to define the business case for client/server. In five years the distributed processing model has raced from a bleeding edge phenomenon to leading edge to mainstream.

According to a recent survey by Sentry Market Research (SMR), 70% of IS shops predict that client/server will ultimately be their primary computing model (See Figure 1).

While most client/server implementations in production have been tactical, corporations are focused on bringing mission-critical, strategic applications onstream. Only 13% of respondents to the SMR survey said they had a strategic client/server application in place at the beginning of 1995. But 28% said they expected to have such an application running in their companies by year-end.

The list of client/server advocates, which includes Fidelity Investments, Charles Schwab, Sears Roebuck, Baxter, Eli Lilly, Bank of Boston and Laidlaw Transit, now runs the gamut from technological trailblazer to follower.

Want to avoid earlier horrors

As the IS masses shift to the new paradigm, though, they want to avoid the horrors that many of the technology's early adopters experienced. Pioneers discovered that their costs ballooned out of control, especially labor, networking and training bills. Expected benefits, such as gains in productivity and improved customer service, were usually expressed in ways that were difficult or impossible to quantify as a bottom-line benefit.

Data access, ease of use, faster response and other intangibles were the highest ranked benefits of client/server cited by respondents to SMR's survey (See Figure 2). Financial paybacks, in the form of reduced IS costs, did not rank in the top 10 benefits.

How can organizations invest millions of dollars without determining the financial return? The combination of three factors — a new corporate business model, perceptions that client/server is the solution to a broad range of IS problems, and a surprising amount of emotion — is propelling the client/server rocket. Although most managers interviewed for this White Paper cite the modest cost-justification studies that they prepared to gain approval for client/server

projects, not one could specify bottom-line results after the system had been put in operation.

"Our livelihood depends on information technology," notes Marshall Carter, chairman and CEO of State Street Bank of Boston. "Initially we tried to calculate a return on investment of client/server, but we realized it was the cost of doing business. We're in the service business, and client/server helps us more promptly respond to customers."

At the dawn of the era of automated teller machines, Carter recalls, State Street Bank of Boston tried to calculate the ROI and return on assets of ATMs, but soon realized that ATMs were, from a business view, mandatory. "I'm not convinced client/server is not another ATM situation," he says.

Client/server's biggest advocates

In the new corporate model so popular today, business unit managers have become the focal point of the enterprise. These managers, who have profit and loss responsibilities, are the biggest advocates of client/server. They are under pressure to increase revenues and earnings through faster and more prolific product development, improved customer service and decreased costs. They view business process re-engineering as the key to achieve these goals, and the new distributed technology is the enabler.

"The business side is the driver," explains Steve Scullen, director of treasury systems at Bank of Boston, echoing the statements of dozens of IS managers contacted for this White Paper. "Every client/server project at the bank is owned and managed by someone in a line of business."

Sears, Roebuck & Co. was typical of the new model: business units buying client/server systems to achieve intangible benefits. A few years ago officials in the accounting department decided they needed a client/server-based multidimensional database modeling package. Company sources say the department reviewed proposals, negotiated a contract and installed the software and hardware without involving the IS department.

But only after operational problems surfaced, such as lack of replication, skyrocketing costs and instability, was IS called in for support. "Users are ecstatic about the information they get from the application," says an IS official.

Company officials say that client/server provides them with the tools they need to achieve their goals. But quantification of the benefits will have to wait until systems are fully deployed over the next several years. For example, Sears' logistics unit, in tandem with the IS department, has been developing new client/server systems to improve customer service and reduce costs.

"We're really hoping to be the leader in home delivery," says Mary Streatoff, a logistics manager. Sears will soon offer home-delivery schedules in two-

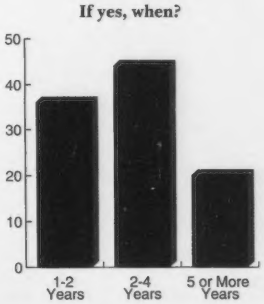
Figure 1

Vast majority see client/server as their primary computing model by 2000

Within four years, 70% expect client/server to play a central role in how their companies compute.



If yes, when?



Source: Sentry Market Research

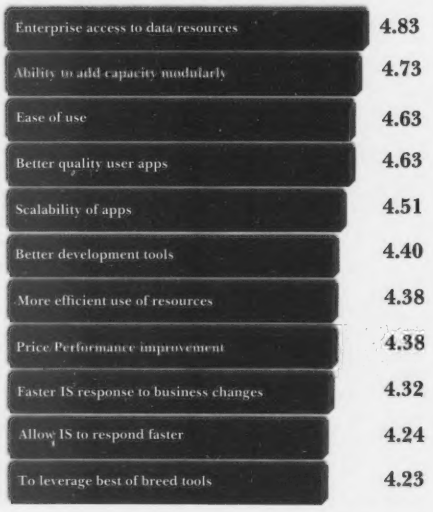
hour increments, with customers' last minute changes accommodated in ways not even provided by Federal Express.

"If a customer won't be at home at the specified time, the truck can be rerouted to deliver it another time," Streatoff adds. "That will leave a positive image in the customer's mind and a compelling reason to shop at Sears. Client/server gives us the information we need in real time, in a way that we can use it to provide this service."

Figure 2

Universal access to data is the chief benefit of client/server

Access to data may top the list of objectives, but there is an extensive set of expectations building for the client/server model.



Source: Sentry Market Research

Intangible benefits, such as ease of use and access, are highly valued by the business unit managers who are providing the emotional impetus behind client/server. Business unit managers angered over delays in getting information from host-based systems, or frustrated by mainframe systems that appear inflexible and hard to use in comparison to their Windows-based desktops, insist on new client/server systems for reasons that have little to do with an immediate and quantifiable payback.

Kevin Murphy, vice president of the James Martin consultancy, says, "Fashion is driving people to client/server. It's become the place to be." Adds Gail Goodman, vice president of marketing for Progress Software, "There's a mania to get to client/server that is not based on a clear hierarchy of benefits."

Outcomes make compelling case

Others insist that the business case for client/server is compelling. "Leading-edge companies are looking at benefits and outcomes: reduced time to market, improved quality and personalization," contends Christopher Greendale, senior vice president for marketing at Cambridge Technology Partners (CTP), a client/server implementation company.

Greendale cites customer benefits of $20 million to $100 million in the first year for client/server applications that created new products and services rather than focused on relatively minor productivity gains. CTP "has yet to build a system without at least a five-fold return in year one," he boasts.

CTP's stunning revenue growth — since 1991 sales have increased 80% per year to $60 million in fiscal 1994 — lends credibility to Greendale's claims. However, a handful of CTP case studies, such as the well-chronicled activities of financial services firm Fannie Mae at creating financial instruments that led to returns measured in hundreds of millions of dollars, may be the exceptions, rather than the rule.

Bank of Boston's trading department offers a down-to-earth snapshot of the business benefits of client/server. It used to take traders up to four months to develop a new financial product. But by year-end, notes Scullen, "we'll be able to bring a new product to market in two weeks" due to a new object-oriented client/server application.

Most companies insist that benefits can't be quan-

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tified. "How do you place a direct value on a tool that might support and enable a particular organizational structure or culture?" asks Al Holden, director of information technology for Laidlaw Transit, a $1.2 billion school bus operator.

Attempts to quantify large-scale business benefits may be a specious exercise. "If a direct-marketer achieves a 3- to 5-second response time versus 3 to 5 minutes for the competition, you know the revenue gains are there. But can you draw statistically valid results from that?" asks Chris Christiansen, senior vice president of International Data Corp.

Adds Bob Spicer, executive vice president and CIO of Chevy Chase Bank, "It's almost impossible to quantify whether a client/server solution, re-engineering, or some other factor contributed to meeting business goals."

Counting end-user productivity as a definable benefit of client/server is especially hazardous. "How do you measure the productivity gain from something a person could never do before?" asks Mark Hanner, program director of the consulting firm Meta Group. "People run into problems figuring the productivity payback from client/server."

Again, business unit and IS managers are certain the benefits are there, but they lack evidence. The new financial and HR suites at Laidlaw reduced overtime, although, notes Holden, "We didn't really quantify the savings. The primary driver was improved flexibility and operations."

> ow do you place a direct value on a tool that might support and enable a particular organizational culture? -- Al Holden, Laidlaw Transit

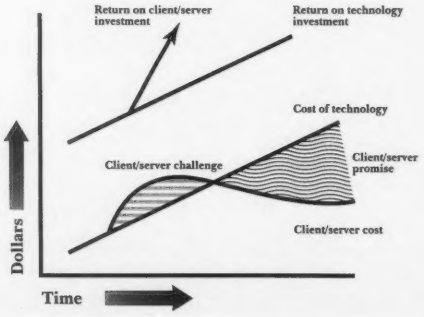
Calculating the costs of client/server is not as straightforward as in a host-based environment. Although spending on hardware, software and services by IS and the business unit can be tracked, most client/server costs are labor-related and spread across the enterprise. And labor-related costs are harder to track because most of them are not specific line items on a budget.

"Few people can answer the question of what client/server will cost," says Ken Dec, vice president and research director at Gartner Group. "Data for some cost elements, such as the time users spend learning, operating and maintaining their desktop system, are not easily available because they are hidden in departmental activity."

Figure 3

Client/server benefits will eventually overtake high start-up costs

The costs of implementing a client/server application are initially higher than experienced with host-based projects, but later decline. Meanwhile, the financial rewards of client/server-based projects rapidly outpace the returns from host-based systems.



Source: Cambridge Technology Partners

Last year Gartner Group developed a hypothetical model to illuminate the costs of client/server, and that model is an eye-opener. The total cost of ownership of a large system over five years was $241.8 million. The system supported 5,000 users in 250 remote locations with a legacy mainframe as well as Unix servers. Almost 75% of the cost was labor (see Figure 4).

"Technology costs



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will continue to decline while labor costs increase, exacerbating the problem," Dec notes.

Client/server implementations currently carry a significant cost penalty relative to host-based environments. According to the model developed by Gartner Group, a client/server implementation carried a 70% premium over a host-based implementation. At the same time, analyses by IDC found a 20% to 200% cost increment, notes Christiansen. Higher costs catch most IS managers by surprise because the client/server cost model is quite different from the familiar host-based cost model.

A few years ago, a typical IS budget allocated 10% of its spending for communications, but that figure can double in a client/server environment. Laidlaw Transit's 10% allocation for networking was at the low end for companies contacted for this White Paper, and proved to be far less than was needed.

"Networking costs were probably 20% to 25% higher than I anticipated," says Laidlaw's Holden, who is using frame relay and other technologies to link several remote sites to the headquarters' servers. "One of the biggest elements was one-time installation costs. We never realized that installs would be $1,500 a site. We're talking over 25 sites."

Time Warner allocated 15% for network costs, Eli Lilly 20% and Bank of Boston 25%, but even higher levels often fail to cover all expenses. Client/server pioneers admit that they underestimated items such as communications capacity requirements, uptime, management and maintenance costs. "Distributed systems are so complex that they verge on chaos theory," says Richard Buchanan, an analyst with consultancy Forrester Research.

Desperate to control costs, IS managers are turning to consultants at a breakneck pace. Third-party spending has more than tripled since 1992. Three years ago, IS managers, on average, spent less than 6% of their budget for consulting and other professional services, but the typical client/server project includes consulting costs of 20% to 30%.

According to IS officials, integrating multiple applications into a cohesive system, and the training then needed, usually require knowledge that internal staff rarely has or could not learn in time. The general rule seems to be that for every dollar spent on client/server application software, $5 to $8 is spent on third-party implementation costs.

Even software vendors acknowledge the need for third parties, noting that they are financially unprepared to support customer implementations to the extent considered standard in the host era. (For data on software's changing business model, see p. 28).

The prospect of steadily mounting costs in the face of uncertain benefits should frighten IS managers and their business-unit patrons. As client/server implementations continue to absorb investments, questions about ROI will become more pointed. Emotional or intangible justifications will be rewarded with a visit to the firing squad. ■

Figure 4

Client/server ownership costs higher on most counts

Mainframes are more expensive than servers, but everything else in distributed computing is more costly. The table compares a mainframe and a client/server environment's cost of ownership over five years for an enterprise with 5,000 users in 250 remote sites.

Cost Category	Percent of cost of host environment	Percent of client/server cost
Labor	57	72
Training, consulting, other	[illegible]	[illegible]
End user hardware and software	3	9
Enterprise hardware	[illegible]	[illegible]
Other	9	8
Total Cost	[illegible]	[illegible]

Source: Gartner Group

White Paper

How Different Industries Make The Case for Client/Server

Client/server technology represents the first wave of information technology investments to focus proactively on expanding business opportunities.

After 30 years of spending hundreds of billions of dollars to build host-based systems to reduce costs, corporations are learning that client/server technology can help them grow existing markets, identify new ones, and improve their product development and customer service. In short, client/server is primarily a tool to increase revenues rather than the typical IT focus on reducing costs by substituting capital for labor.

As the following case studies demonstrate, there's a business case for client/server in a variety of settings and in all industries. Banking, finance, manufacturing and communications are but a few of the dozens of industries that are deploying client/server architectures to create new products and services, or offer improved products and services. And there's a business case for client/server regardless of technological environment — legacy, greenfield, object-oriented and remote.

CONSUMER BANKING

At Chevy Chase, the IT Model is Inclusive

Speedier loans and 100% uptime depended on meshing host with network

There are no second chances in consumer banking. If a customer gets impatient waiting for a loan application to be processed, gets frustrated by a long wait for a teller, or can't use an ATM because the network is down, the customer will take that business somewhere else. Chevy Chase Bank, in suburban Washington, D.C,. has assets of almost $6 billion, and it wanted to grow that figure rather than see it shrink. To support its business goals of improved customer service, the savings and loan decided it had to create a computing infrastructure that would marry the best of the mainframe world with client/server computing.

"A mainframe can take you only so far," notes Bob Spicer, executive vice president and CIO of the bank. "A client/server architecture can take it further, but neither one can get there by itself. The two together create a powerful solution, exploiting the advantages of both so we can deliver better products and service."

Infrastructure is biggest challenge

In the five years that Chevy Chase bank has been building client/server applications, it has linked more than 2,000 users in more than 100 locations with its IBM 3090 mainframe. In addition to the mainframe server, there are more than 200 servers supporting Token Ring LANs and five client/server applications. The host is configured as the primary data warehouse, while the LANs are secondary repositories. "The biggest challenge is creating the overall infrastructure on which to build and extend," Spicer explains.

Once the infrastructure was in place, a variety of systems could be deployed or improved to achieve the business goal of improving customer service to keep existing customers and attract new ones. It used to take up to eight days to process a mortgage application; now they are processed in 30 minutes. Bank teller systems are up 100% of the time.

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TEXAS INSTRUMENTS

None of the bank's strategic goals would have been met by modifying the host or deploying a client/server system alone. "It wasn't until client/server started making headway that we started meeting those objectives," Spicer notes.

It took more than a year to build the basic software infrastructure to incorporate the mainframe into a client/server web. Since many of the middleware tools necessary to integrate mainframe and client/server databases and applications did not exist when the client/server efforts began, the bank had to develop its own approach.

> It wasn't until client/server started making headway that we started meeting [our] objectives. -- Bob Spicer, Chevy Chase Bank

IS staffers discovered client/server's architectural Rosetta stone in the Distributed Computing Environment (DCE) — the Open Software Foundation's blueprint for applications interoperability. It outlined a scheme to use remote procedural calls to link applications and processes. Spicer's staff realized that remote procedures could be incorporated into a mainframe's CICS regions. Client/server applications could be partitioned between the CICS regions acting as servers and the OS/2 clients. Hundreds of remote procedures are stored in each CICS region, along with the server portion of each application.

"We have about eight CICS regions in the mainframe, and each looks like a logical application server to the client," Spicer explains. "To the clients, the mainframe looks like eight different servers on the network."

Once the infrastructure's architecture was determined, the IS department had to build a lot of middleware — interfaces between platforms and applications. Then IS had to develop some utility-like functions to manage the distributed architecture, since network and systems management tools for a distributed client/server network did not exist five years ago.

According to Spicer, systems, network and configuration management is a "huge challenge," with thousands of clients on hundreds of LANs, especially since the bank offers information and cash around the clock. The network must run 24 hours a day, seven days a week, to support cash machines, telephone inquiries and a sales staff peddling mortgages via laptops.

The bank chose several tactics to simplify the development and integration of applications between the client/server and mainframe platforms. To smooth integration between hardware platforms, Spicer's team chose AIX and OS/2 as the desktop and server operating systems, because both supported CICS. Client/server versions of mainframe applications, such as the SAS family, were used to simplify interoperability. And the existing COBOL programmers were retrained to write client/server applications.

The big gamble

Spicer's move to retrain existing staff was a big gamble. Many organizations opt to hire consultants and implementors to develop new client/server applications, leaving the IS staff to concentrate on existing development and maintenance projects. Spicer acknowledges the risks, but his team of 20 COBOL developers "had a thirst for education," he says. "They couldn't wait."

The hurdles that the IS veterans had to climb were formidable. The programmers and developers had to extend the functionality of legacy mainframe applications to a distributed environment. To do that they had to learn how to partition an application (which part of the application is on the server and which part on the client), in order to optimize performance. In addition, they had to learn how to build GUIs that were intuitive and yet consistent across applications.

Spicer adds another observation. "Developers today have to be a lot more communications sensitive than ever before," he says. "They had to learn how to do recovery in client/server, what happens when a transaction fails in the middle and how to synchronize databases."

Five years after embarking on the safari through

Inside Chevy Chase's network

Mainframe: 3090 MVS/ESA
Servers: IBM RS/6000 for applications;
PS/2 95 for file and print sharing
Workstations: PS/2 and Thinkpad
Operating systems: MVS (CICS), AIX, OS/2
Network OS: LAN Server
Number of users: Currently 2,000; eventually 3,200
Communications devices: Newbridge hub;
Crosscom routers
Strategic software: Connect from SAS;
COBOL Workbench from Micro Focus;
SmartSuite for OS/2 from Lotus Development

Chevy Chase banks on strategic client/server applications:

- Mortgage loan application and analysis
- Telemarketing
- Voice response for customer balances
- Branch operations
- Customer service

Return on investment:
"To deliver loan approvals in 30 minutes to customers 24 hours a day, seven days a week, impacts market share. We built a solution to do that."

the mainframe and client/server jungles, Spicer says it will be at least more five years before the tools and infrastructure of the distributed environment matches the mainframe. Meanwhile, progress to date has been dramatic from a business perspective.

"To deliver loan approvals to customers 24 hours a day, seven days a week impacts both market share and customer service," Spicer says. "And we built a solution to do that."

Later this year, look for Part IV of the Enterprise Software Directions Series: Service Solutions for Client/Server

COMMUNICATIONS

Press TWC for More Options

Time Warner's greenfield systems launch a new company

Invaders need advanced technology if they hope to conquer an entrenched foe. Just as the U.S. Army stunned its World War II enemies with radar, the atomic bomb and other weapons, Time Warner Communications is taking aim at local telephone service with a client/server architecture. Already a cable television service provider to more than 11.5 million households, TWC has begun offering telephone service to its subscribers.

Given the poor customer service and reliability image of cable systems, and the expected ferocious response of the regional telephone companies, Time Warner needed a flexible but ultra-reliable infrastructure to provide superior telephone services.

Survival of the fittest

A host-based environment was out of the question. Instead, over the past two years, information services and systems manager Mohammad Fahim and his staff of 70 programmers, analysts, technicians and network administrators selected multiple client/server architectures using objects, expert systems, data warehousing and other advanced technologies. "If we don't have these tools, we won't survive in this competitive environment," he notes.

Speed is of the essence. Time Warner is not only competing with an existing local telephone company in each of its cable service areas, it is also racing against the expected introduction of new telephone services by cellular providers. The client/server architecture adopted by the company cuts application development time in half via a data warehousing approach. The company's systems strategy was to separate data from applications in order to simplify application interface development.

"Historically, when you've had mainframe-based applications in large organization like ours, you've had 40 or 50 different apps, and developers spent all their time figuring how to get stuff back and



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forth between apps," Fahim notes.

"Now all customer, product and network information resides on the Corporate Data Platform and is shared by all business support and operational support systems," he continues. "Any application can just go to the database and get the data it needs. Separating data from the application is a key tenet for my development."

Fahim chose several client/server architectures to maximize efficiency, not cost. Some applications are designed with the fat client/skinny server model, while others rely on the server for at least some applications processing. While multiple partitioning schemes necessitate relatively robust workstations and servers, Fahim contends the combination is the most effective approach.

"There are a number of ways to do client/server, and I don't think you'll find one architecture that does everything you need all the time," he explains. "You have to know and accept the tradeoffs."

Saving systems deployment time by buying off-the-shelf packages was not an option for Fahim. Time Warner Communications, headquartered in Englewood, Colo., is one of the first cable companies to offer telephone services to its subscribers, and Fahim could not find suitable packaged applications for a variety of order processing tasks.

Rules always changing

So, given the volatile nature of the market — "the rules change every six months," Fahim says — he decided to build an expert system with 1,500 rules. "We had to come up with a rule-based system so that we don't have to rewrite the application itself, but can just change the rules," he explains.

Like everybody else building client/server applications, Fahim was surprised by the hand-coding required to build an infrastructure. Even in his greenfield environment, building middleware interfaces between applications and other elements was more difficult than expected.

"I've learned that you had to make a significant investment in middleware to do client/server applications that work," he says.

However, the combination of applications development techniques adopted by Time Warner Communications results in better turnaround cycles than most IS managers are currently experiencing. According to Fahim, the development cycle is reduced to six months or less, about one-third to half the time required in a traditional mainframe environment. Delays due to the interface and other infrastructure challenges only lengthened the process by 10% to 15%, he notes.

But Time Warner expects that the payback will be huge. Unlike existing systems operated by the regional telephone companies, Time Warner's client/server architecture enables it to start or modify service for residential customers within minutes of receiving and validating an order. Linkages between the order processing and network operations systems provide near instantaneous service start-ups for new customers, while the telephone companies require several days to initiate service.

Building such mission-critical applications using client/server technology led to certain challenges. Maintaining client/server networks requires more time and money than mainframe-based systems.

"Software is easy, networking is difficult," Fahim says. "The challenge is not just getting an applica-

Objects, rules and client/server

Description: Customer order processing
Development cycle: 6 months
Staff size: 15, plus offshore developers
Cost: close to $300,000
Return on investment: "While we intend to look at ROI, it's not an issue right now. If we don't have these tools, we won't survive in this competitive environment."

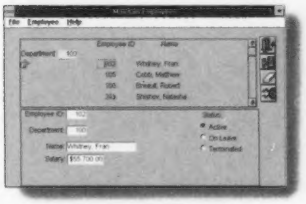
Time-Warner's sophisticated message

Architectural elements: combination of fat client/fat server, with data warehouse, objects, rule-based systems
Servers: Sun (20)
Database software: Sybase
Applications development tools: SmallTalk
Visual Works
Workstations: Sun (200)
Network devices: Cisco routers, Bay Networks hubs
Consultants: Sybase Professional Services, Cressoft

DEVELOPER PRODUCTIVITY COMPARISON

Sybase

PowerBuilder 4.0



52 lines of code

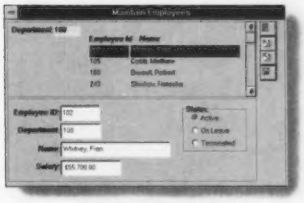
```
ELSE
  COM
  dw_n
  dw_n
END I
Master
ed
long er
long ro
rownur
empnu
IF dw_
  COM
ELSE
  ROLI
  Messa
detail")
END I
Master
close(p
Master
dw_det
dw_det
dw_det
Master
```

```
Application.Open
SQLCA.DBMS=ProfileString("PB.INI","Data
base","DBMS","")
SQLCA.DbParm=ProfileString("PB.INI","Da
tabase","DbParm","")
open(w_employees)
Application.Close
DISCONNECT using SQLCA;
IF SQLCA.SQLCODE <> 0 THEN
  ROLLBACK using SQLCA;
  MessageBox("Disconnect",SQLCA.SQLER-
RTEXT)
END IF
MasterWindow.Open
CONNECT using SQLCA;
IF SQLCA.SQLCODE <> 0 THEN
  MessageBox("Connect
Error",SQLCA.SQLERRTEXT)
  HALT
END IF
dw_master.settransobject ( sqlca )
dw_detail.settransobject ( sqlca )
IF dw_master.Retrieve() = -1 THEN
  ROLLBACK using SQLCA;
  MessageBox("Retrieve","Retrieve Failed")
```

** Taken directly from "PowerBuilder Getting Started"
© 1991-1994 By Powersoft Corporation.

Oracle

Developer/2000



4 lines of code

```
exit_form;
create_record;
delete_record;
commit_form;
```

It's amazing how many lines of code you'll find behind the exact same application.

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ORACLE

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tion to work anymore, but keeping the network up and working all the time. Your maintenance criteria go up." Distributed processing of mission-critical applications means that more redundancy is required than for decision support applications. "We cannot afford to miss even one alarm," he notes.

> The challenge is not just getting an application to work, but keeping the network up all the time. -- Mohammad Fahim, Time Warner

Indeed, Fahim sounds almost wistful for the mature systems management infrastructure that most IS managers take for granted. Client/server environments require administrators with multiple levels of expertise, in Unix, LAN operating systems, desktop OS and database systems. That takes two to four administrative bodies that were not necessary in a host-based environment, he notes.

However, don't expect Time Warner Communications to be buying big iron.

FOOD & BEVERAGE

Will Better Field Data Spur Soft Drink Sales?

Field sales support dictated a new approach by Dr. Pepper

Food marketing is the ultimate zero-sum game. Since population growth is modest, revenue and earnings gains come from the competition, not from market growth. Soft drink makers competing against the two giants, Coca Cola and Pepsi, have an especially hard time expanding their turf.

Yet Dr. Pepper/Cadbury North America is determined to sharply increase sales of about $1 billion this year, in part by empowering its field sales force. To achieve its plan, the mainframe had to go.

"We determined that our systems weren't supporting our business growth," explains Tony Chiravolo, IS director. "The ability to capture, analyze and react to beverage case sales was our number one project."

Top management and IS determined that the company had to re-engineer its business processes by adopting a client/server architecture built around the needs of its 166 field sales persons. They dubbed the first client/server effort Project Concorde, after the supersonic jet.

Complete transformation

In less than two years, the Stamford, Conn., company revamped its entire culture, structure, sales support approach and IS infrastructure. The company abandoned the traditional paper-based reports from a mainframe in favor of a realtime, online client/server system for mobile users. "We now capture, plan and analyze our bottler case sales on a client/server platform," Chiravolo says. "We are no longer using the mainframe for this purpose."

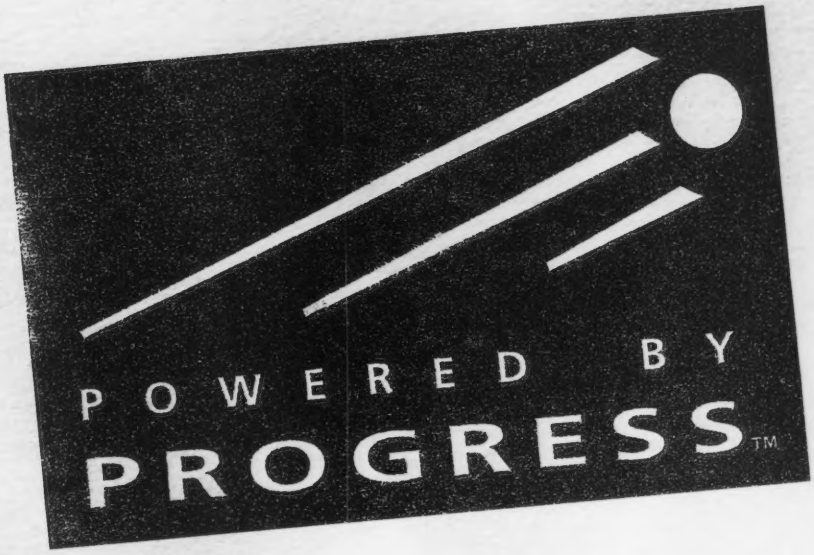
Mobile users with Compaq 486-based laptops running a front end to a Microsoft Access database written in Microsoft Visual Basic and other Windows applications gain access to the company's IBM RS/6000 servers via dial-up access at 14.4Kbps. A custom-written Windows application pulls data from an Oracle database to provide the front-line troops with sales volumes, trends and other information they need to be effective.

In addition, remote users have the same Lotus Notes electronic mail access as headquarters staff. Weeks of hand coding hardcopy reports have been reduced to a few minutes' worth of keystrokes.

Company officials are confident that the new technology infrastructure, which has been in operation for almost a year, is helping Dr. Pepper sell more soft drinks.

"I can't tell you it's going to grow our business by 2% or by 10 million more cases," concedes Chiravolo. Instead, his objective is this: "We're hoping that people will be equipped with tools and information they need to grow our business.

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"We've got 166 people out in the field, but they are not salespeople anymore," Chiravolo adds. "They are business people, and in order for them to perform, they need the ability to look at their business in a lot of different ways.

"We're going up against Coke and Pepsi, so the time we have with our bottlers — our sole customers — is very important. We want to arm the field sales force with the best information on a fact-based selling platform in order to help them work along with the bottler. We weren't able to do that before."

Delivering on the promise of client/server architecture for mobile users was as complicated as people might imagine. Consultants estimate that the infrastructure needed to support mobile users adds 20% to the cost of a client/server implementation. Providing mobile users with the same technological features and capabilities used by home office staff is usually impossible, given the relatively narrow bandwidth available via laptops' internal modems. Instead, custom-built variations of home office applications are developed.

Those on Dr. Pepper/Cadbury's corporate staff use a sophisticated multidimensional modeling tool, DataServer Analyzer, but it would have required a capacious data pipe to feed the laptops. Furthermore, it provided more analytical features than the field could absorb and use in bottler presentations. A crew of five developers wrote a simplified data access tool in Visual Basic for the laptops in under five months. The needed slices of information are inserted in Access, with built-in macros designed to quickly identify sales trends by bottler, product or region.

Some of the application development work was farmed out to Legacy Technology of Woburn, Mass., which had been a long-standing co-developer of earlier systems in place at Cadbury. Up to seven Legacy consultants supported Chiravalo's staff of 10 in-house developers.

Mobile challenge

Managing mobile technology in a client/server environment remains a challenge, though. Field staff are not reluctant to add software to "their" personal computer, Chiravolo notes, which makes remote support and maintenance a series of unique adventures rather than a routine process.

"The ability for us to manage and control what software resides on over 150 PCs out in the field is a challenge," he concedes. "At times, the software and hardware configuration reacts differently across the same hardware set . . . because you've got different software out there." Cadbury has at least four people assigned to field staff support.

To solve the problem, the IS department is increasing the functionality of the laptops but not allowing additional software packages to be bundled into the units. "If we develop our laptops the right way, we're hoping to capture 80% to 90% of the salesperson's needs," Chiravolo explains.

Overall, automating the field force accounted for roughly 20-25% of the $2 million cost of Project Concorde, Chiravolo estimates. The system was rolled out earlier this year. And Cadbury is on schedule for rolling out the rest of its client/server applications by the middle of next year.

"We plan on unplugging the mainframe on June 30, 1996," says Chiravolo.

Dr. Pepper's formula for success

Strategic software: Lotus Notes, Oracle, Microsoft Office
Operating system, tools: Unix (AIX), PowerBuilder and Visual Basic
Applications development consultant: Legacy Technology of Woburn, Mass.
Servers: 7 Compaq Proliants, 3 IBM RS/6000s (shared with other Cadbury units)
Network OS, topology: NetWare, TokenRing
Laptops: Compaq

Flying high with Project Concorde

Type of application: Sales and marketing system for headquarters and mobile sales force
Estimated cost: $2 million
Duration: One year (mid-1994 to mid-1995)
Number of users: 166 in the field, 180 in headquarters
Return on investment: Sales programs tracked in minutes, rather than 3- to 4-week delays. "Now the field is able to react to market conditions because they have information in a more timely fashion and in a better format."

FINANCIAL SERVICES

The Object is Flexibility

Development of financial products speeds ahead with a combination of object technology and client/server

Client/server technology is the newest weapon in the electronic arms race on Wall Street. Millions of dollars are won or lost in seconds on Wall Street, and its banks and brokerage firms are on a continual quest for the fastest workstations, servers and communications networks.

Foreign-currency traders at the Bank of Boston will soon be able to develop new financial instruments in two weeks instead of the three or four months it used to take them, due to a series of new object-oriented client/server systems developed to replace a host-based architecture.

> If you called some of the major business users on the floor, they would be able to describe object-oriented programming. -- Steve Scullen, Bank of Boston

"Our goal was not to move to the client/server world," explains Steven Scullen, director of treasury systems. "Our goal was to retool the systems to allow the business to become more flexible."

Building the applications as a series of objects in a client/server environment made it easier for the users to react quickly to financial markets. "That's critical in a trading environment," Scullen notes.

In addition, the combination of objects and client/server puts more computing horsepower closer to users, he says, which allows them to do more, faster.

The use of object technology and a client/server architecture are the keystones of a $25 million revamp of the technology base for Bank of Boston's 400 traders and support staff.

The typical application cost was between $3 million to $4 million, of which roughly 30% was for software, 25% was for network hardware and services, 25% for Sun workstations and servers and 20% was spent on consultants, systems integrators, training and other third parties. About half of the software spending was for packaged applications, the other half was internally developed.

Dominant architecture

"Client/server is the dominant architecture in our shop," notes Scullen. "Two years ago, we had six mainframe systems, but at the moment we have one mainframe system left, and we are rapidly moving off of it as part of a migration to a pure client/server, Unix-based environment. We should be done migrating away from legacy systems by mid-1996."

During the past two years, the bank's programmers and traders have developed several mission-critical client/server systems using object technology. Market prices and volumes are now pumped into the bank's internal portfolios and trading applications. Within a few months, a home-grown risk management system will be in production as well.

Building these applications using object technology represented a fundamental change in the bank's development models.

Structured programming based on sequential procedures is not the way to build an object-based application. Programmers as well as traders had to redefine their approach to applications development. "The programming staff and the business staff have to think differently than they might have in the past," Scullen says.

Everything is an object. Each financial instrument is a different object, and each event about the object, such as an interest payment from a bond object, is an object in itself.

Quick to grasp nuances

After making that huge mental leap from a career in structured procedural programming, the bank's IS staff had to grapple with the standard client/server issues, such as which object runs locally, or which

object resides on the server. Typical of most financial trading environments today, the masters of the universe were quick to grasp the nuances of object technology, Scullen claims.

"I would bet if you called some of the major business users we have on the floor, they would be able to describe object-oriented programming," Scullen contends. The combination of object technology in a client/server environment essentially requires a much more intensive relationship between the IS programmers and the users.

"We have to understand the business perspective, and they have to understand how we put the system together," Scullen explains. "It becomes a much more iterative process." Each project is owned and managed by someone on the line-of-business side, but IS is the builder of the applications and the environment.

Users of object technology, such as Scullen, have watched with increasing relief as the confusion over object standards and technology has subsided. C++ has become the de facto language of choice for creating objects, which also provides portability across applications, he notes. The Common Object Request Broker (CORBA) paradigm from the Object Management Group, and the upcoming interface between CORBA and Microsoft's object designs and models, could make object development and deployment much less of a headache in the future.

Applauds detente

Bank of Boston uses CORBA and Scullen applauds the recent OMG-Microsoft détente. "I think we're going in the right direction," he says. "I'm not sure whether it will get us there. It's not a done deal." A bigger issue for Scullen and other object adopters is the linkage between objects and legacy systems.

"The layer between the object world and the database world is a real challenge for us," says Scullen. The data underlying an object is usually stored in a RDBMS, not an object oriented database.

"Therefore you have a database model that does not map to the object," Scullen says. "So if you change the object, you're forced to go back and change the database."

Despite the interface challenge, Bank of Boston discovered that the technology was maturing to the point that its application development came in roughly on time and on budget. Scullen attributes the financial success of the project to several factors. The primary factor was the line-of-business ownership of each application and the secondary factor was the targeting of project deliverables every 90 days.

The business case for the bank's object-oriented client/server applications is a series of metrics that relate to making the trading department more agile. In the old host-based environment, development of a new security or financial transaction would take three to four months. "By the end of 1995, we'll be able to bring new product to market in two weeks instead of three to four months," Scullen says. ■

The tools of the trade

Servers: 80 Unix, 3 to 4 NetWare
Workstations: 220 Sun, 200-300 PCs from DEC
RDBMS: Sybase
Programming language: C++
Consultants, system implementors: 45 internal developers and six to 10 consultants

Trading up at Bank of Boston

Applications: Realtime data analysis and trading systems
Number of users: 350-400
Cost: $3 million to $4 million per application, part of $25 million trading room revamp
Project history: Started in 1993; legacy migration to be completed by mid-1996
Organizational style: Line of business owns each application, built-in iterative process by IS
Return on investment: "By the end of 1995, we'll be able to bring new product to market in two weeks instead of three to four months."

Later this year, look for Part IV of the Enterprise Software Directions Series: Service Solutions for Client/Server

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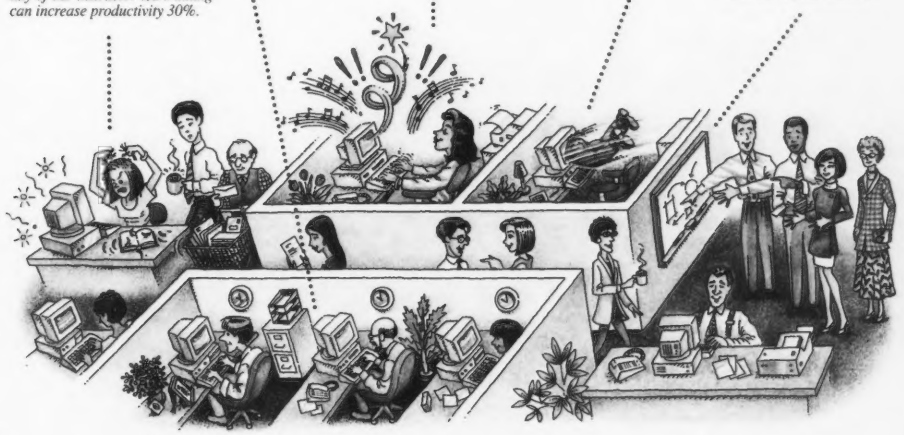
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White paper

A New Relationship Between Vendors and Users?

Companies that have adopted client/server architectures and technologies have had to change in many ways. They've had to rethink their approach to information technology, their business processes and their expectations. If that's not enough, the implementation of client/server has added a layer of complexity to their computing environments that makes many long for the days when one supplier could be their soup-to-nuts partner.

So much for wishful thinking.

The client/server model has changed things for the vendor community, too. Dramatic shifts in the IS budget model reflect a fundamental change in the business models of software vendors.

Furthermore, the mainframe era business model for software vendors—low volume, high margins, with service and support bundled into the purchase price—has been destroyed by the personal computer pricing mindset that prevails in client/server. Now even companies that once eschewed indirect channels, such as BMC, Dun & Bradstreet, SAS and Intersolv, are adding third parties to their sales teams.

How will the change in business model accompanying client/server affect the relationships many companies have had with their suppliers? Will the move to a model dominated by third parties strain these relationships, making it harder for users to communicate their wants and needs, and distancing vendors from a valuable source of knowledge about their customers' businesses and technology needs?

Talks with dozens of companies adopting client/server indicate that, at least initially, there has not been significant erosion in the communications quality between buyers and sellers. But as client/server matures, the burden of managing multiple vendors for users, and many more customers for vendors, could begin to take a toll.

"We cannot offer to everybody what we had offered in the past," concedes Dr. Peter Zencke, a member of the SAP AG executive board. Adds Marc Sokol, vice president of product strategy at Computer Associates International, "In the future, vendors will need better communications with their VARs and their customers. If not, we could wake up one day and not know what's going with customers."

> We could wake up one day and not know what's going on with customers. -- Marc Sokol, Computer Associates

The new realities are already causing disruptions. The rise of client/server as the dominant environment for enterprise computing is shattering the budgetary model of corporate IS departments and devastating the business model of software vendors.

IS managers who used to spend around 15% of their host-environment budget on software allocate 20% to 30% of their client/server budget. Moreover, all that extra money isn't buying as much service and support as they need — the IS consulting and services budget has more than tripled at the same time, to 20% to 30%. The business case for

client/server still exists, though, in part because the plummeting cost of hardware has partially offset the higher software and support charges.

"Four years ago, our average price point was $9,500 per product," notes Kevin Burns, chairman and CEO of Intersolv, a vendor of client/server development tools. "Today, if you walk in and say 'I've got a tool for you, it's $9,500,' the response is 'Does it come with a computer?' There's been a downward pressure on our average revenue per unit and average per order size."

Service now extra

The new model is based on selling much higher volumes at much lower prices and margins by using lower-cost indirect sales channels. Service and support are extra, and are increasingly supplied by third parties. "In the mainframe/MIS sales model of yesteryear, the expectation was big orders, typically $200,000 to $300,000, and we threw in service," Burns notes. "In the new client/server business model, with average revenue of $3,400, there's no room to throw anything in."

To slash selling costs, most enterprise-software vendors are relying more on indirect sales, telemarketing and other sales alternatives. Developing a VAR channel reduces a vendor's cost-of-sales 10% to 25%. As Fig. 6 shows, the percentage of revenues from indirect sales are soaring at software vendors that had been associated with the direct sales approach. Nearly half of worldwide software industry revenues now originate with a third party, up from 17% in 1990, according to IDC (see chart above).

As software vendors lower their prices and shift their sales costs, their revenues from service and support will have grown 60% from 1993 to 1996, to an estimated $25.8 billion, according to IDC. But soaring support revenue does not mean that IS managers are getting the level of support they demand, and expect, from their enterprise software vendors. Quite the contrary.

Vendors are under a siege of inquiries from an ever-larger pool of less sophisticated customers. This results in a double-whammy: more telephone hot lines are tied up for longer periods of time. Even worse, many of the new enterprise vendors tell their customers that the long delays will continue to be the rule, not the exception.

Figure 5

Nearly half of software sales are via the indirect channel

In just five years, indirect channels are poised to dominate software sales.



Source: International Data Corp.

"We spend a lot more time on the phone and playing tag with different vendors," says Bob Check, director of development support, central IS division, Sears, Roebuck & Co. With one application development tool vendor, his staff routinely spends 45 minutes waiting to talk to a support technician. "We feel that's an unacceptable wait time in the queue, but that's what the vendor considers its service level."

Vendors have cogent defenses of the current support quagmire. Client/server is infinitely more complex to support, because the heterogeneous environment makes every crash a new mystery with an almost infinite number of potential perpetrators.

Some vendors are aggressively expanding their support departments in response. A tripling or quadrupling of their client/server support ranks, relative to the mainframe level of support, is typical. "We are in the middle of a shift to support our largest accounts more aggressively," says Barrett Joyner, vice president of North American sales for the SAS Institute. "We've already more than doubled the staff, and we're still hiring and growing the number of people. We'll end up at three times."

Furthermore, many vendors insist that their expansionist VAR programs will provide vastly improved service and support. Software vendors argue

that major corporate customers demand a level of knowledge about applications that is best satisfied by a team lead by VAR specialists. As more mission-critical applications are developed on a client/server architecture, vendors argue, more specific and detailed applications knowledge becomes paramount. VARs are best suited to provide that first tier of applications knowledge, these vendors claim.

"There is no way one company can be all things to all people," says Ken Walters, vice president and general manager for channel programs at Dun & Bradstreet Software. "Lots of partnerships is the answer. This isn't an abdication of responsibility, just a better way of providing support."

Adds Gail Goodman, marketing vice president for Progress Software, "There is [more] desire for specialization than in the past, finding organizations that know the industry and application."

> "There is more desire for specialization than in the past, finding organizations that know the industry and application. -- Gail Goodman, Progress Software

IS managers say that the access to industry- and application-specific VARs is an advantage, as long as they can retain direct contact with the vendor. According to Mohammad Fahim, director of information systems and services for Time Warner Communications, third parties routinely find solutions that are unknown to the primary vendors. "But with any of the key vendors, you have to be able to get to them directly," he adds. "That's the only way you can influence their strategic direction and get long-term technical support for growing the product."

Many vendors realize that they must provide a combination of interfaces. As RDBMSs becomes the foundation for mission-critical applications, large corporate customers demand a direct connection to the software vendor. "They want access to the latest version of the software, they want access to the development people and they want access to the vice president of service who they can yell at," says Steve

Figure 6

Direct selling under siege at many software companies

Vendor	Revenue (Annual, $millions, most recent fiscal year)	% Indirect (Currently)	% Indirect (Future)	Number of third parties (Now)	Number of third parties (Future)
BMC	288.5	20	35-40	42	200
Computer Associates	2,622.9	10	"much larger"	2,000	NA
D&B	406+	25*	40-50	50	100-150
Informix	470	45	40	5,000	Adding 125/quarter
Intersolv	115	20	35	173	>300
Oracle	2,997	30**	50**	5,000	5,000
PeopleSoft	112.9	20*	20	20	20
Progress	139.2	66	66	2,300	2,700
SAS	482	NA	NA	100	200
Sybase	693.8	24	30	2,000	2,000

* Mostly sales by overseas distributors ** % of license revenue + Includes modest non-software revenues

Source: Sentry Market Research, company statements

SAP: Wary of Its Own Success

IS managers have never seen anything like the R/3 explosion. Between 1994 and 1995, SAP, the Walldorf, Germany, company will have sold more than $1.5 billion in client/server applications software to almost 4,000 organizations around the world.

SAP's integrated suite includes applications supporting financial, manufacturing, marketing and sales, distribution and human resources departments. The R/3 sales surge is propelling SAP's revenues to an estimated $1.7 billion this year, according to Wall Street analysts.

However, SAP's success is creating a serious challenge for companies that have purchased the software. R/3 is a complex product to implement and is considered a CPU cycle hog. Many companies are adopting R/3 as part of a business process re-engineering effort, and the combination of implementation complexity and re-organization is a "double-whammy," says Joshua M. Greenbaum, of the Hurwitz Consulting Group, Newton, Mass.

Adds Barry Wilderman, program director of application development strategies at the Meta Group, "Many of the R/3 projects are slow or late." Widespread shortages of R/3-savvy programmers, analysts and implementors are creating a headache for IS managers . . . and a windfall for consultants.

SAP has a multipronged strategy to solve these problems. A scaled-down version of R/3 is now being tested in a handful of companies. More importantly, the company is augmenting its sales model with a corps of VARs, who have been recruited to sell and implement the new product.

Ten beta sites in the U.S. are currently using "Heidelberg," a miniature version of R/3 that has "less than 10%" of its total functionality, according to Hasso Plattner, vice chairman and a co-founder of SAP. The initial release runs on Windows NT. Heidelberg is designed for companies with $50 million to $150 million in revenue, he says, and will be in 100 beta sites in 1996.



SAP is directly supporting Heidelberg in the U.S. "We will use the knowledge gained to figure out how to configure smaller systems," says Dr. Peter Zencke, a member of SAP's executive board.

In addition to the U.S. effort with Heidelberg, SAP has embarked on a VAR program in Germany. SAP has signed up 20 VARs to offer preconfigured systems that will reduce the time required to implement. "We're not rolling this out internationally," says Zencke. "We will run it for two years and see if it is successful."

Yet Plattner acknowledges that, ultimately, a VAR channel for Heidelberg will make a lot of sense. "In the end, it should go through the VAR channel," he says. "This is a change in our model, but we are sure we need this."

Observers see two motivations for the Heidelberg development. Wilderman says it is a defensive move by SAP designed to address the cost and delays in implementing R/3 by large companies. Others see saturation of the Fortune 1000 market ahead, given SAP's recent successes and the aggressive efforts by Oracle and other companies.

"They figure that growth will slow significantly with the larger corporations," explains Greenbaum of Hurwitz Consulting.

Either way, SAP faces an ever-expanding challenge: supporting its growing number of customers. Notes Greenbaum: "One of the potential stumbling blocks for SAP is to grow its support network fast enough to satisfy market demand."

Sommer, vice president of marketing for Informix.

Coming up with the appropriate service structure that meshes support from third parties and the major vendors is challenging IS managers and their suppliers. Corporate customers are left to organize, track and pay for an infinitely variable series of relationships. Some suppliers, such as Computer Associates, position their VARs as the primary support contact. Others, including Informix, say that most customer inquiries are basic technology questions that they are better qualified to answer.

Some IS customers, and their reluctant vendors, are demanding a major unbundling of service and support options. Instead of the standard annual service and support fee — 12% to 15% of the price of the software —some customers want to pick and choose which elements they buy from each partner. A la carte shopping for training, hot-line support, newsletters, on-line access and other service and support components is on the rise.

"We're getting more pressure to unbundle our services," says Goodman of Progress. "There's a trend away from lump sum service support charges." Adds Craig Richards, vice president of marketing at D&B Software, "As alternative channels become more mature, there will be a greater need to offer support services on a menu basis."

Unbundling is also being driven by end-user department managers, contends Michael Melenovsky, vice president of services industry research at IDC. "As decision-making leaves the CIO and moves to the business units, a best of breed selection is taking place. Customers want to know what providers are really good at."

Nowhere is the fracturing of what had been the service and support monolith more visible and costly than during implementation. The cost of implementing SAP's R/3 integrated suite of enterprisewide client/server applications exceeds the $1 million to $3 million cost of buying up to 70 software modules by a factor of five to 10. SAP officials are aware of the hue and cry over the implementation challenges (see sidebar, p. S-29). Meanwhile, most of the 4,000 or so SAP customers are works in progress, even if little or no modification is planned.

Eli Lilly is adopting the R/3 accounting modules, with the help of Big Six firm Ernst & Young. "We're not modifying the software at all," says Ed Tunstall, executive director of IT. "We'll adapt our business processes to go with the ones that are available." Despite that modest approach, costs have soared. Total cost of the project is "more than $10 million," says Tunstall, noting that more than 20% of the cost of Lilly's client/server projects is for consultants.

> As alternative channels become more mature, there will be a greater need to offer support services on a menu basis. -- Craig Richards, D&B Software

Lilly's experience illustrates the transition from implementations of the host-based environment. In the mainframe era, 75% of the cost and effort involving in installing and implementing a system was borne by the customer and its primary hardware supplier. Client/server reverses the ratio.

"Less than 25% of our accounts are doing the implementations themselves," notes Walters of D&B. "Right now there is exploding interest in third-party implementors. Our partners can't add people fast enough." ■

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Reaching for the stars

Zenith boxes stand out for their PowerPC support

By Jaikumar Vijayan

In its first foray into the PowerPC arena, Zenith Data Systems recently announced a line of single and multiprocessor systems based on the RISC chip.

With this announcement, Zenith Data becomes the most prominent vendor outside the PowerPC alliance to support the PowerPC.

So far, apart from IBM, Apple Computer, Inc. and Motorola, Inc., other significant vendors that have announced products based on the PowerPC chip are Canon Computer Systems, Inc. and Tatung Science and Technology, Inc.

Zenith Data's Z-Power and Escala PowerPC models make up the high end of the company's Z-Server line of Intel Corp.-based servers. They will run IBM's AIX Unix operating system initially and target the high-end workstation and departmental server markets, according to John O'Keefe, executive vice president of servers at Zenith Data.

"We chose AIX [over NT] because today, right now, there are a lot of business applications for it, and there simply aren't enough business-critical applications for Windows NT. But our intention is to be absolutely in both markets" when Microsoft Corp.'s NT matures, O'Keefe said.

The Z-Power workstation series is powered by the PowerPC 604 chip and comes in both desktop and minitower form factors. The systems accommodate up to 128M bytes of RAM and 4G bytes of disk space.

They also are equipped with integrated networking, graphics, business audio, "fast" (100M bit/sec.) SCSI drives and both Peripheral Component Interconnect and Industry Standard Architecture buses. Prices start at $4,219.

Server snapshot: Zenith Data's Z-Power DT

- **PROCESSOR:** 100-MHz PowerPC 604
- **RAM:** Up to 128M bytes
- **DISK STORAGE:** Up to 4G bytes
- **BUILT-IN STANDARDS:** Ethernet, "fast" SCSI
- **BUS:** Peripheral Component Interconnect and ISA I/O
- **OPERATING SYSTEM SUPPORTED:** AIX 4.1 and Windows NT 3.51
- **STARTING PRICE:** $4,219

High reach

The Escala series, meanwhile, will be Zenith Data's high-end minicomputer alternative. Based on the 601 chip — upgradable to the 604 or 620 — the system can support up to eight processors and can be configured with a maximum of 2,048M bytes of memory and 36G bytes of internal hot disk storage.

Analysts said it is unclear whether Zenith Data's arrival in the PowerPC camp means more momentum for the PowerPC, especially since Zenith's parent company, Groupe Bull, is a PowerPC advocate.

"It certainly is powerful technology, but the question is: Will it become the wave of the future or will it just be a ripple?" asked Nathan Nuttal, an analyst at BIS Strategic Decisions in Norwell, Mass.

Problems plague accelerator boards

Multimedia Windows 95 users hit a few snags

By Tim Ouellette

A number of early users looking for faster multimedia for Microsoft Corp.'s Windows 95 are finding that some accelerator boards are not up to speed yet.

Users have been venting their frustrations on on-line forums about problems installing these graphics, sound and video cards on to their PCs. Most are concerned with problems with the drivers, the software that communicates between the card and system.

However, industry watchers said only some of the accelerators are having problems. Many are just fine, which is good with the transition from 16-bit to 32-bit systems.

Multimedia accelerators are add-in boards that let PCs provide brighter colors, better resolution, faster video and more resonant sound.

Breaking the graphics gridlock

A graphics accelerator can help speed Win 95 graphics-intensive 32-bit applications in the following ways:

- **Freeing up the CPU.** The accelerator does all drawing and screen refreshing.
- **Improving resolution** on smaller monitors to increase the viewable area of the desktop
- **Managing the drain on system resources** that comes with using the 15-in. or larger monitors usually needed for imaging applications

No surprise

Industry watchers had predicted there would be problems with a number of graphics and video cards running with Windows 95 [CW, May 1]. For example, many Diamond Multimedia Systems, Inc. users complained that even though drivers for its SpeedStar, Stealth and Viper cards came with the CD version of Windows 95, the drivers don't work well and limit the amount of resolution and color users can attain.

"I can't speak for anyone else, but running 640 by 480 resolution on a 20-in. screen isn't my idea of working drivers!" said one Diamond user in a CompuServe forum. The San Jose, Calif., firm, a market leader in multimedia accelerators, expects the shipment of upgraded drivers later this year.

Beyond the software issues, one vendor has run into hardware troubles. Matrox Electronic Systems Ltd. "is wrestling with considerable hardware difficulties," said Bill Caffery, an analyst at Gartner Group, Inc. in Stamford, Conn. He said Matrox cards have experienced some glitches due to the use of a nonstandard memory format.

The Dorval, Quebec, company denies there are any installation problems due to the format.

Even with these problems, the PC cards should be in hot demand, thanks to high sales of Windows 95 and the need to improve the system's performance.

"Prices have stabilized after falling rapidly in 1994. And they may go up because of the scarcity of memory chips," said Jon Peddie, principal at Jon Peddie Associates in Tiburon, Calif.

Not all multimedia vendors have had Win 95 transition issues. Caffery credited Number Nine Visual Technology Corp.as one company that has shown "they know how to write solid drivers," he said.

Bus standard

CONTINUED FROM PAGE 39

to such a standard bus."

One key benefit of the serial bus will be the ability to "hot attach/detach" peripherals — that is, add or remove devices at any time without having to power down or reboot.

Capable of supporting up to 127 different devices, USB is Plug-and-Play compatible, which means peripherals will be detected and configured automatically as soon as they are physically attached.

Despite signs of growing momentum, the standard interface isn't expected to be widely implemented until mid-1996.

One connector for all

The bus will give users a single connector for all devices, including those that in the past used serial ports, parallel ports, keyboard ports, mouse ports and game ports.

Plug and Play is a technology that allows users to automatically attach or configure peripherals to their computers without specific add-in cards or drivers. So far Plug and Play has focused mainly on inside-the-box PC connectivity for elements such as network cards, graphics adapters and video controllers.

USB will bring Plug and Play capabilities outside the box so users can attach external peripherals to one standard interface on their PC and have the device automatically recognized and configured.

Smaller, too

Because the bus essentially consolidates the different PC ports into one standard interface, it is also expected to take up less space than existing ports — an aspect that is expected to be particularly significant for portable computers.

"It would certainly make purchasing of peripherals and cards easier for users," because they won't have to worry about compatibility issues, said Joseph Ferlazzo, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Briefs

Microsoft expands deal

Cincom Systems, Inc. and **Microsoft Corp.** expanded a year-old development and marketing agreement to give Cincom resale rights to all of Microsoft's products, including Windows 95 and BackOffice.

Brains for boxes

National Semiconductor Corp. has created an embedded version of Intel Corp.'s I486 chip. The chip can embed processing capabilities in devices such as multifunction fax/copier/printers, TV set-top boxes, telephones (mobile and desktop) and point-of-sale and handheld terminals. Prices will range from $15 to $25.

Macromedia buys Fauve

Macromedia, Inc., a San Francisco developer of multimedia authoring software, has purchased image editing software maker **Fauve Software**.

Win 95/Exchange link goes mobile

Mobile users of **Microsoft Corp.**'s Office for Windows 95 will be able to exchange information with an upcoming release of wireless connectivity software by the ARDIS Co. in Lincolnshire, Ill. The software will enable communications between Microsoft's Exchange Server and Windows 95 clients. The ARDIS wireless-enabling software for Exchange Server will consist of a matched set of client and server Messaging Application Program Interface (MAPI) agents that optimize the MAPI message for wireless.

Win 95 vs. Mac OS

CONTINUED FROM PAGE 39

would take place sequentially, and users would have to wait longer for the task to be completed.

Apple has promised to add multithreading to its Mac OS by the end of next year. That, along with pre-emptive multitasking, will be included in the Copland release.

A publishing company that specializes in English-to-Russian translations recently chose to use graphics software running on Microsoft's Windows NT even though the company has a Power Macintosh. "As Windows NT becomes more popular, the overall market share of the Macintosh will probably shrink," said Boris Molodyi, an engineer at Perevod Services, Inc. in Naperville, Ill.

Low end heats up

Dyrk Daniels, a senior designer at a large aerospace firm, said the major Mac-vs.-Windows 95 competition is in the low end of the graphics market.

The tight integration of Macintosh hardware and software still gives it an edge in speed and stability for high-end professionals, he said.

However, Daniels said Windows 95 graphics software will likely cut into the Macintosh market on the low end — unless Apple drops its prices again.

Molodyi agreed. "The Mac has more specialized software and more support for desktop and high-end graphics. But for what the majority of people need on the low end, you can get in Windows software for less," he said.

Windows 95's support for long file names also will help designers in mixed Macintosh and PC environments. The Macintosh has always had longer file names, compared with the short names in the 16-bit PC graphics world.

"This will help preserve existing lengthy Mac file names, and it'll make it easier to work in mixed Mac and PC environments," said David Huss, a beta tester of Corel Systems Corp.'s Windows 95 graphics packages and member of Microsoft's Windows 95 response team.

Huss and others said the virtual memory management of Windows 95 also will make it possible to load huge images with few or none of the performance penalties that used to come with Windows 3.x.

Corel Corp. was the first to release Windows 95-compliant software, CorelDraw 6, in late August. The upgrade price is $249.

Adobe Systems, Inc.'s fully Windows 95-compliant version of Photoshop and Micrografx's Windows 95-compliant ABC Graphics Suite will be out before the end of the year.

Win 95 migration

CONTINUED FROM PAGE 39

tion may be cost-effective for many companies, some analysts said.

"For [corporations] that don't have the resources, outsourcing is a viable option," said Colleen McCormick, a research associate at Gartner Group, Inc. in Stamford, Conn.



However, some companies may find that the outsourcing option isn't necessarily less expensive than doing the work themselves. But many of the services, including Bell Atlantic's, are priced on a per-seat basis, which at least allows them to predict how much it will cost.

"One of the big problems in client/server computing is that it [has] lots of hidden costs, and [per-seat pricing] takes some of the guess work out," said Jim Greene, an analyst at Summit Strategies, Inc. in Boston.

In fact, cost will likely constrain some corporate IS groups from taking advantage of such outsourcing services, even though they sound appealing.

Outsourcing the migration "sounds like a great way to do it," said Mark Porter, manager of technical management at CUNA Mutual Group, a financial services provider in Madison, Wis. But, Porter said, severe budget constraints will force his company to forgo any outsourcing help if it decides to migrate some of its PCs to Windows 95.

In the $300-$800 range

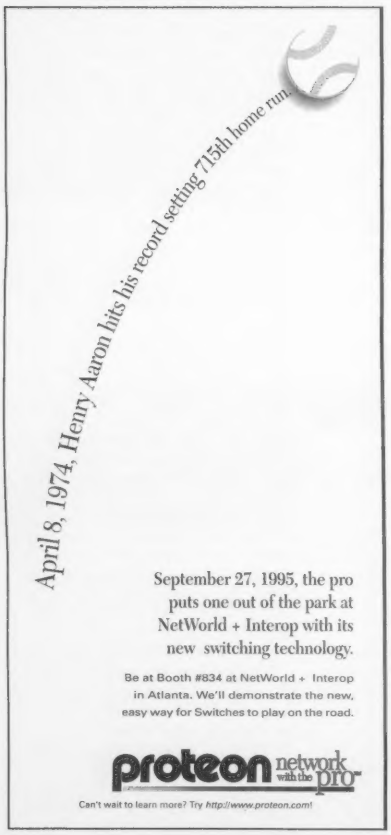
Indeed, outsourcing Windows 95 will not be cheap.

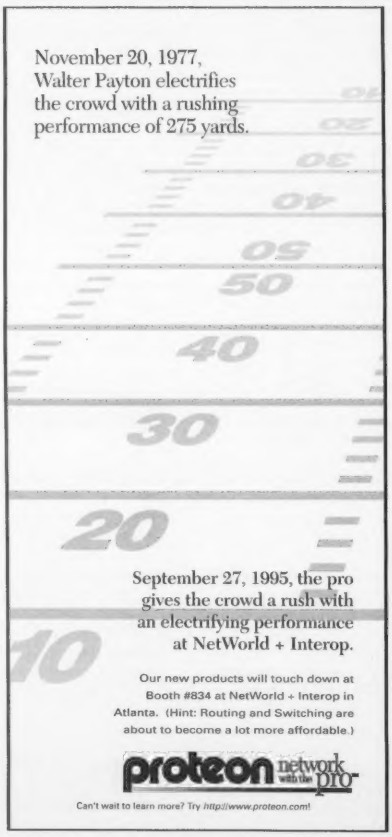
"About $325 per seat is a good rule of thumb," said Jeff Prestel, program manager of desktop services at AT&T GIS, although he acknowledged that costs could run anywhere from $800 to as little $300 per seat. AT&T GIS currently has more than 70 engineers trained to do migrations.

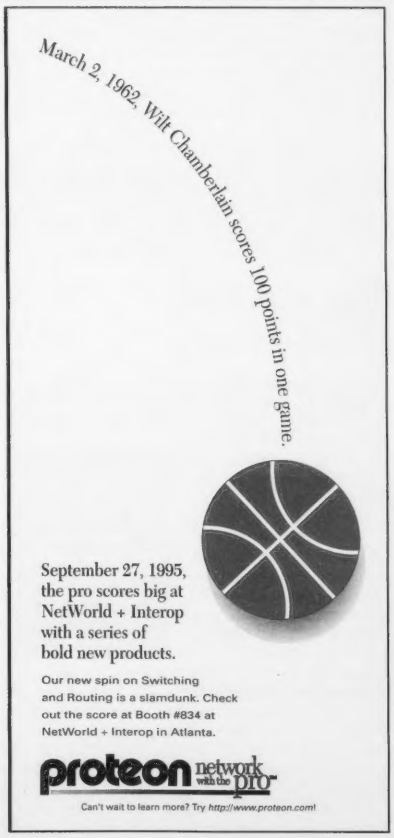
That price doesn't include the cost of upgrading PC hardware with larger hard drives or more RAM or the cost of Windows 95 or any applications.

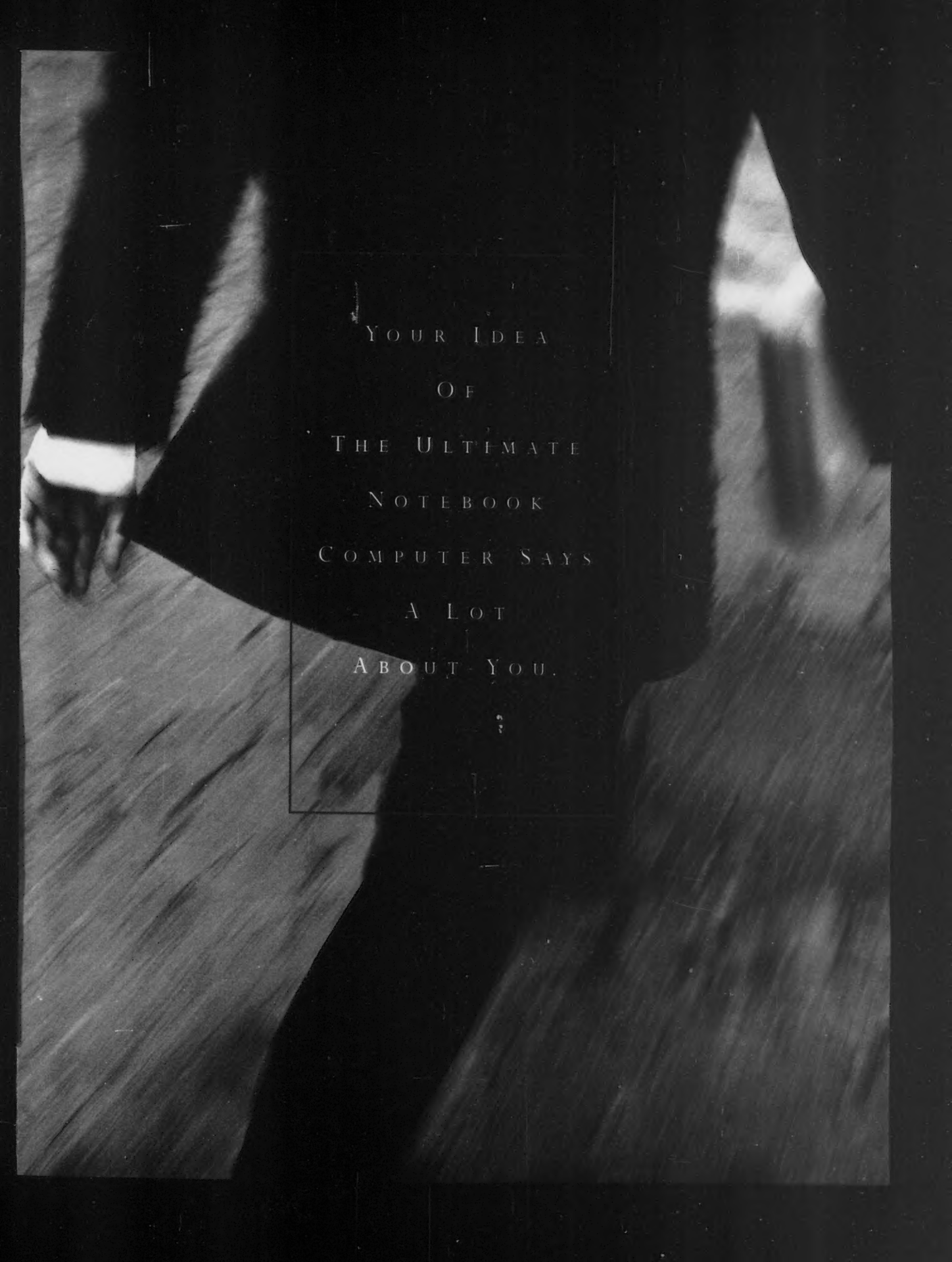
It does include analysis of the customer's PC assets; creation of a migration plan, which begins with testing the customer's applications; creating a pilot; and complete installation. Users also receive training and help desk support.

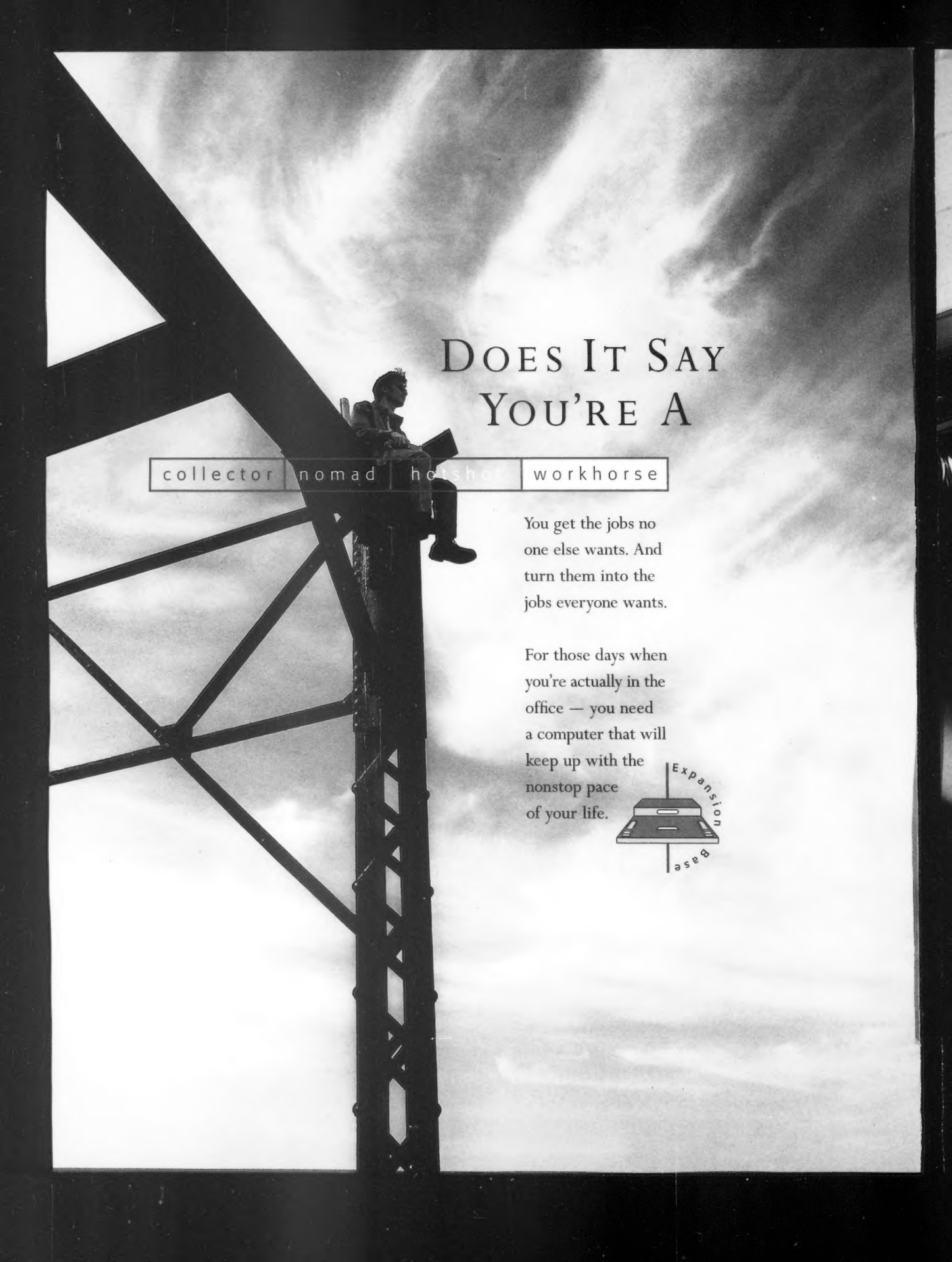
But don't count on doing it all in one weekend, McCormick cautioned. "It's going to be a long-term contract [running] over quite a few months," she said. "You can't expect them to come in and in a month be done."



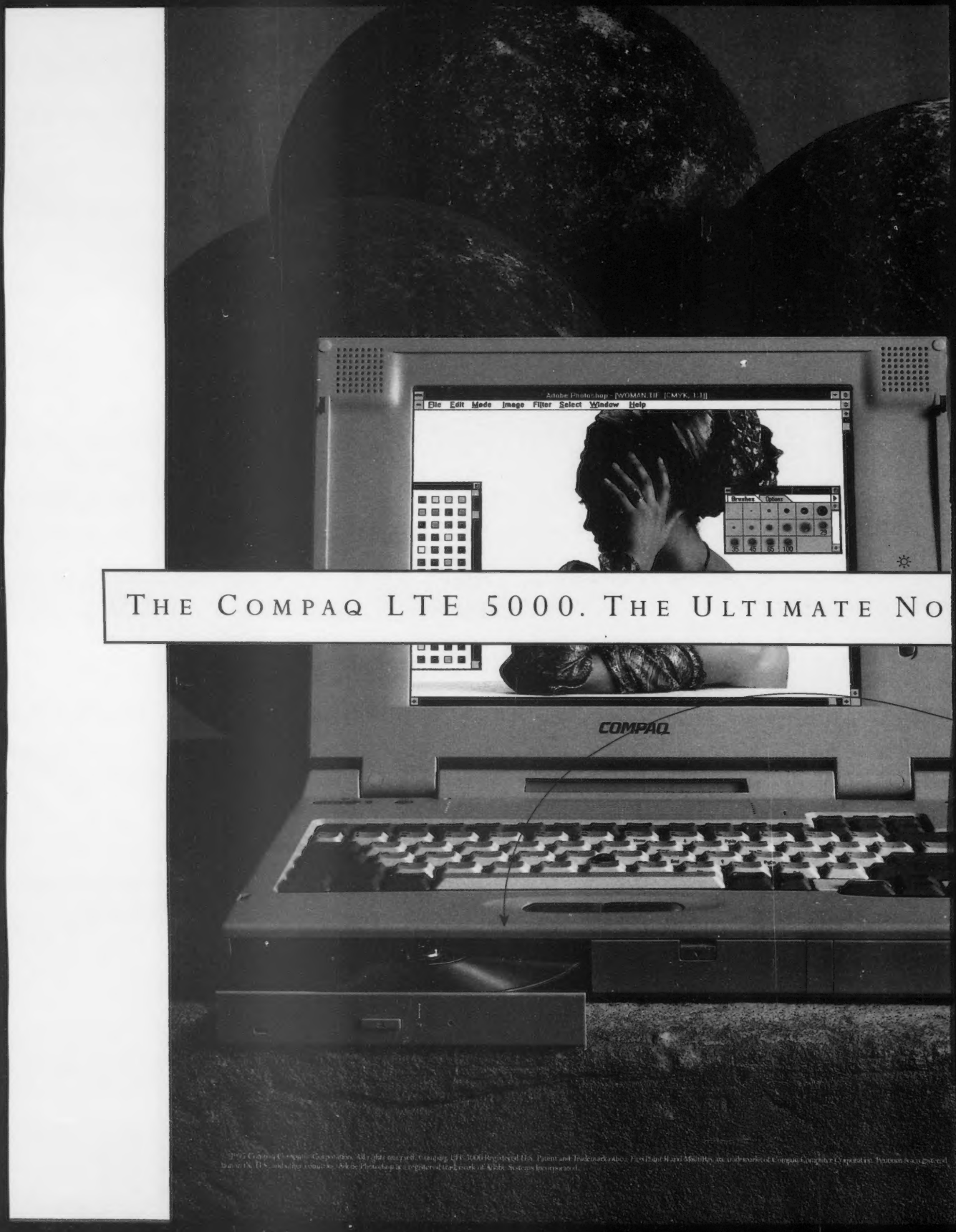





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nomad
hotshot
workhorse
You get the jobs no one else wants. And turn them into the jobs everyone wants.
For those days when you're actually in the office — you need a computer that will keep up with the nonstop pace of your life.
Expansion Base


OR A
collector
nomad
hotshot
workhorse
That's Ms. Hotshot
to you.
When they said
you couldn't have
a CD-ROM drive
and MPEG video
in a notebook,
you replied
coolly:
Yes I can.
CD-ROM DRIVE



THE COMPAQ LTE 5000. THE ULTIMATE NO

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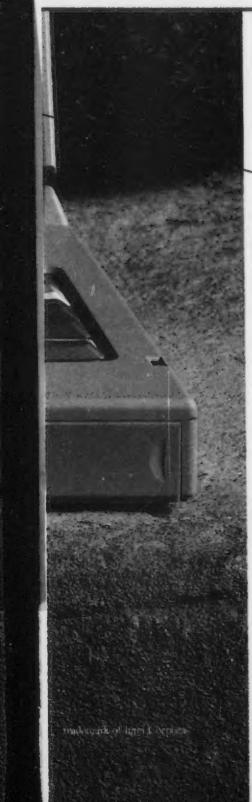


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You know exactly who you are. Well, at this exact minute. But the way things go, this probably changes several times a day. Which is precisely why we created the LTE 5000.® A Pentium® powered notebook featuring interchangeable devices, giving it the ability to change as quickly as you do. We started with features any self-respecting notebook user demands: a Pentium processor, a full-sized keyboard (complete with the EasyPoint II™ pointing device), an 11.3- or 10.4-inch 800 x 600 LCD screen and two PCMCIA slots. Then we added memory expandable to 72 megabytes, 16-bit stereo sound and speakers, and optional MPEG video. But we left the cool part — the interchangeable part — up to you. The LTE 5000 is completely modular. So you can mix and match capabilities at the drop of one of your many hats. For starters,

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there's a removable hard drive (going up to a hefty 1.35 gigabytes). A long-lasting lithium ion battery. And the kicker is the unique front-loading MultiBay — because it can do everything else. Running the world's biggest database? Use the MultiBay for a *second* 1.35-gigabyte hard drive. Making a multimedia presentation? Plug in a CD-ROM drive. Need more juice for a long flight? Plug in a second battery. Need to share some files? Plug in a floppy drive. In fact, the MultiBay is so useful, we built an expansion base featuring two of them. So in the office, you can be fully connected with everything working at once. And when you pack up, just configure the LTE 5000 for what you'll need on the road. It all adds up to a refreshing combination of the most advanced technologies and highly evolved common sense. Call it the technological cure for multiple personalities. Interested? Call us at 1-800-345-1518 (select PaqFax option) or visit our Web site at www.compaq.com.



Home PC is where the novelty is

Cutting-edge consumer technologies will hit corporate desktops next year

By Jaikumar Vijayan

If you want a preview of what's next for the corporate desktop, look no farther than your home PC.

In a flurry of recent announcements, several major PC vendors unwrapped their latest lines of consumer PCs, many of which sport leading-edge technologies expected to wend their way onto the corporate desktop by early next year.

Among these technologies are faster processors and modems; full-motion, full-screen 30 frame/sec. video support; better graphics capabilities; and larger monitor sizes not typically found on most corporate desktops.

"Corporations will move to multimedia," said Steve Kleynhans, an analyst at Meta Group, Inc. in North York, Canada. "With things like the Internet and Web pages becoming important internal technologies for corporations, multimedia technologies, too, become important."

Kleynhans said these applications will require the more robust graphics and communications capabilities now being integrated into home PCs. Emerging applications such as on-line training and help also will drive these technologies onto the corporate desktop, he said.

A sampling of fall PC announcements

COMPAQ COMPUTER
Presario 5000
- 75- to 133-MHz Pentium
- Hardware-based MPEG video
- Specialized surround sound
- Wavetable synthesis for processing sound
- Quad-speed CD-ROM drive
- Up to 1.6G-byte hard drive

IBM
Aptiva
- 75- to 133-MHz Pentium
- Voice recognition and command
- MPEG video
- Stereo-quality sound
- Wavetable synthesis for processing sound
- Up to 1.6G-byte hard disk

Similarly, the emergence of technologies such as hardware-based Motion Picture Experts Group (MPEG) video support will make it possible for developers to incorporate video help clips into standard desktop application packages without the risk of seriously degrading processor performance.

"I definitely see applications coming along for these technologies, but not right now," said Aleta Floyd, a data processing supervisor for Santa Rosa County in Milton, Fla.

One application such technologies will make possible is video kiosks, which "the public could walk up to and access a wide range of information from," Floyd said.

Vendors rolling out fall consumer products include Compaq Computer Corp., which is introducing an all-Pentium Presario line of home PCs, and IBM, which will offer a fully refreshed all-Pentium Aptiva lineup. Also releasing new consumer products recently were Acer America Corp., with its Aspire line of PCs, and Hewlett-Packard Co., with its Pavillion line.

These systems are based on Pentium chips ranging from a 75-MHz version to the latest 133-MHz chip. They come with varying capabilities, including MPEG-quality video, 14.4K and 28.8K bit/sec. modem communications, high-fidelity CD-quality sound, voice-recognition capabilities, built-in telephony and, in Acer's case, multiple color choices and a major departure from the PC's standard boxy look (see chart).



Chances are you're altogether too familiar with "simple questions" like these. Invariably, they come at the worst possible times. Usually, they require immediate attention. And, more often than not, there's hardly anything simple about answering them. Unless, of course, your organization is one of the thousands that have come to rely upon LightShip®, from Pilot Software, for the power of answers on demand.

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Boston October 3	**Detroit** October 24	**Nashville** October 18	**San Diego** October 26	**Washington, D.C.** October 5
Chicago October 12	**Denver** October 25	**New York City** October 5	**San Francisco** October 17	
Cleveland October 17	**Los Angeles** October 25	**Philadelphia** October 10	**San Jose** October 18	

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International Technology Associates, Inc. has unveiled the Touche Touch Pad, an input and pointing device.

According to the Sausalito, Calif., firm, the Touche Touch Pad is an intuitive device that replaces mechanical pointing devices, such as mice and trackballs. It lets users drag, click and double-click with a finger motion across a touch-sensitive surface.

The Touche Touch Pad senses finger movement on its surface and responds by moving the cursor across the screen. It has screen-edge sensors that let users move to the edge of a screen without lifting and retracking. It also has a control panel that lets users customize cursor movements, the pad's sensitivity and advanced gestures. For graphics applications, finger pressure can be translated into varying brush strokes or line weights. It is available in serial and Macintosh models.

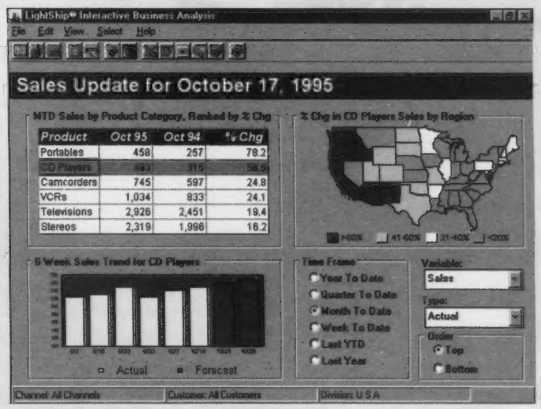
The Touche Touch Pad costs $60.

▶ *International Technology Associates (415) 331-6222*



International Technology's *Touche Touch Pad*

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Pinnacle Micro, Inc. has introduced the Apex 4.6G-byte, 5¼-in. rewritable optical drive.

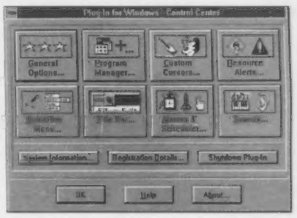
According to the Irvine, Calif., company, the drive offers very high capacity on a single 5¼-in. disk with performance equal to that of hard disk drives with a 6M byte/sec. data rate.

The Apex drive uses a "fast" SCSI-2 interface with a raw data rate of 6M byte/sec., a synchronous sustained transfer rate of 4.5M byte/sec. and a synchronous burst rate of up to 10M byte/sec. It was designed for general data storage and data-intensive applications, including digital audio, digital video, desktop publishing and data archiving.

Pricing starts at 37 cents per megabyte.

▶ *Pinnacle Micro (714) 789-3000*

Plannet Crafters, Inc. has rolled out Plug-In 2.6 for Windows, a Windows utility.



Plannet Crafters' *Plug-In 2.6 for Windows*

According to the Alpharetta, Ga., company, Plug-In 2.6 for Windows creates a user-friendly desktop environment by adding features and options. Its features include nested groups in the Program Manager, support for a separate data directory, a title-bar clock, reminder alarms, full sound support, custom cursors, resource alerts, desktop restriction settings, program scheduling and power button access to a customizable multilevel QuickRun menu.

The product runs on Microsoft Corp.'s Windows 95, Windows 3.1, Windows 3.11 and Windows for Workgroups.

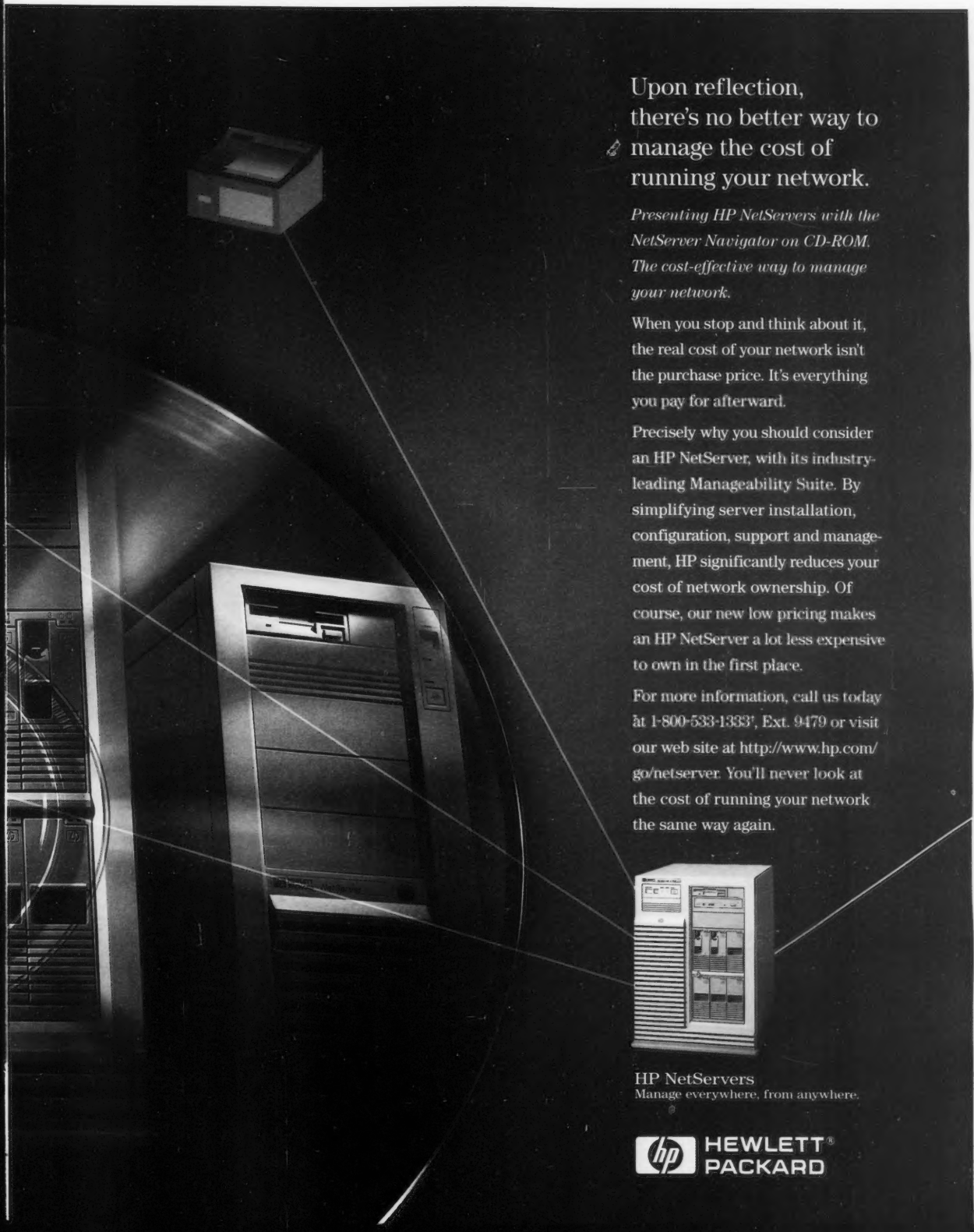
Plug-In 2.6 for Windows costs $20.

▶ *Plannet Crafters (770) 998-8664*

Product shorts

Avid Technologies, Inc. has introduced TransJammer 2, transitional effects plug-in libraries for Avid VideoShop and Adobe Systems, Inc.'s Premiere. It features two- and three-dimensional transitional effects and includes a manual of sample illustrations of every effect. Cost: $100. Avid Technologies, Tewksbury, Mass. (508) 640-6789.... **Wyse Technology, Inc.** has introduced the Wyse WY-14+ and the Wyse WY-15E, color desktop monitors. The WY-14+ has a maximum resolution of 1,024 by 768 pixels at a rate of 60 Hz. The WY-15E has a maximum resolution of 1,280 by 1,024 pixels at a rate of 60 Hz. Cost: $359 for the WY-14+, $479 for the WY-15E. Wyse Technology, San Jose, Calif. (408) 473-1200.


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11:30 PM
Firm's working late on big project.
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11:31 PM
Weird sounds from printer
interrupt your bliss.

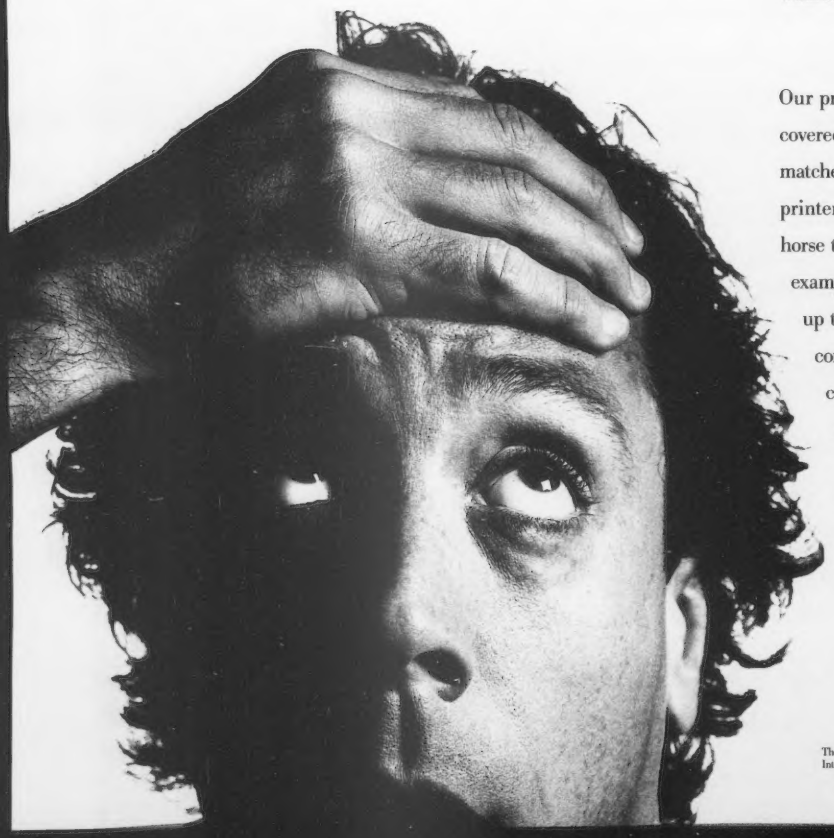
GRRR-UNK GRRR-UNK

11:32 PM
Realize you never learned those words
in fourth-year French.

11:33 PM
But you have IBM printers. You get IBM service.

11:59 PM
They translate over the phone. Printer's saying,
"Refresh my memory."

12:07 AM
Everything looks smart. Including you.
Thanks IBM.



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APPLE GETS SERIOUS ABOUT NETWORKS, 57
UNIX IS HERE TO STAY, 62

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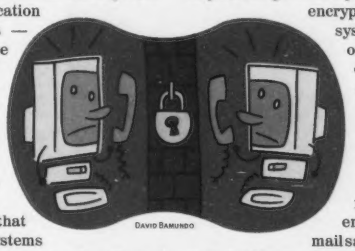
E-mail security ignored

Directory standards exist but enforcement lacking

By Suruchi Mohan

Despite the horror stories that occasionally flash across the front pages of daily newspapers, most companies pay scant attention to electronic-mail security.

There are several reasons for this lapse, including a lack of education among the top brass — stemming from a sense that "nothing terrible" has yet happened, even though the E-mail system to which they entrust their secrets is porous — and the cost of implementing security measures.



Even companies that want to make their systems secure sometimes find the technology doesn't support their needs.

"I see an awful lot of people sticking their heads in the sand, denying that the problem exists," said Lt. Rex Buddenberg, a security expert at the Naval Post Graduate School in Monterey, Calif. "It isn't hard to build products, but [the industry] has had a slow start."

From the top down

Management doesn't always appreciate the importance of E-mail, said Charles Cresson Wood, an independent consultant at Information Integrity Investments, a consultancy in Sausalito, Calif. "These days, with electronic data interchange and electronic forms, [E-mail is] becoming very important."

Wood said it might help if management thought of its investment in security as an investment in infrastructure, similar to setting up a telephone system, for example.

Some companies are doing just that. For example, a large oil company is planning to use encryption for its nine E-mail systems. It is also rolling out a system that will enable the encryption of E-mail attachments. These attachments are not secured if the message goes through a gateway.

Securing an internal network isn't enough to guarantee E-mail safety. "We want a global security framework to which we can add" our own security framework, said Paul Rarey, managing architect at DHL Systems, Inc. in Burlingame, Calif. "Within the private network, encryption is not necessary."

However, the situation changes when a company has dealings with others and messages have to go over a public network, which is easier to hack. In those instances, companies often must leave their own networks and move to public networks. These networks are security challenged — every server on the network adds

E-mail security, *page 67*

Notes part of IBM workflow

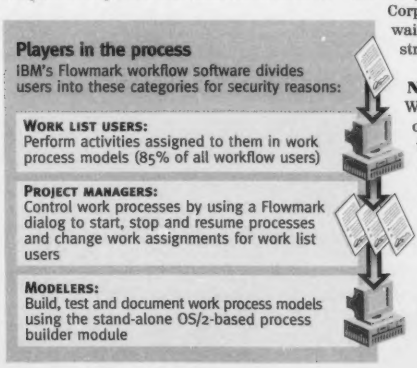
Strategy undergoes revamp as Notes moves into top spot

By Tim Ouellette

IBM's workflow software, Flowmark, is suffering from an identity crisis now that Notes groupware has become part of the family.

Since its purchase this summer of Lotus Development Corp., IBM has removed much of its IBM Workgroup software in favor of Lotus products, though Flowmark will remain [CW, July 24].

"The difficult thing for customers is trying to understand where the product fits in relation to other groupware products," said Scott McCready, an analyst at International Data Corp. in Framingham, Mass. "People are waiting for IBM to articulate a workflow strategy."



Naming the difference

Workflow software automates the flow of work items through a company and tracks the status of the process from a database. Groupware, on the other hand, lets users collaborate on documents stored in centrally accessed databases.

Dick Sullivan, director of marketing for IBM Workgroup, said integration plans between the products include letting users start a Flowmark workflow process from within Notes. In that scenario, Flowmark would

IBM, *page 65*

Storage screamers

SCSI vendors prepare for faster future

By Steve Moore

Vendors of computers and peripherals that communicate via the SCSI interface are hustling to supercharge the standard.

These vendors are seeing the handwriting on the wall in the form of high-bandwidth networks and data-intensive multimedia applications.

The first version of SCSI supported 5M byte/sec. transfer rates, and today, Ultra SCSI tops out at 40M byte/sec. transfer rates. While new higher-speed serial interfaces are in the works (see chart), they will require users to invest in disk drives and cabling designed to handle those higher rates.

What users will be able to do with serial interfaces that they cannot do with parallel SCSI is "put storage elements on a network and logically tie them together in virtual arrays," said Mike Peterson, president of Strategic Research Corp. in Santa Barbara, Calif.

SONIC SCSI

STANDARD	TRANSFER RATE
SCSI-1	5M byte/sec.
SCSI-2	10M byte/sec.
16-bit Wide SCSI-2	20M byte/sec.
Ultra SCSI	40M byte/sec.
"Serial" SCSI	Up to 200M byte/sec.

User need lags

For now, many users appear content to stick with tried-and-true parallel SCSI technology. "We haven't run up against disk I/O as a major problem in what we're doing," said Larry Shaw, PC coordinator for client/server support at Nordstrom, Inc. in Seattle. The retailer now finds the SCSI-2 interface to be "generally adequate" for its AT&T Global Information Solutions Pentium servers, he noted.

According to analysts, users will likely leave it to computer and storage system vendors to determine which new serial interface is implemented in the computers and peripherals they buy in the future.

"IS managers will tend to buy in terms of a total package," said Bob Katzive, vice president of Disk/Trend, Inc. in Mountain View, Calif. "They won't care whether the interface is parallel, serial or mice on a treadmill as long as they get the performance, reliability and price they want," he explained.

That total package might include Fibre Channel-Arbitrated Loop (FC-AL), which ultimately may support a somewhat higher transfer rate than the competing Serial Storage Architecture (SSA). But "for people buying desktop computers and small servers, it won't make much difference," Katzive concluded.

Now vs. later

While "users can actually build a system now with SSA products," FC-AL hardware "won't be available until later next year," said Phil Devin, a principal analyst at Dataquest, Inc. in San Jose, Calif. Until then, it is in the interest of FC-AL vendors "to push users into higher performance levels of [parallel] SCSI," he said.

Hardware vendors said they are working as fast as they can to implement faster interfaces.

"Right now, we're migrating toward Wide SCSI. Toward the end of the year we envision [supporting] Ultra SCSI, and early next year we expect to have a Fibre Channel offering," said Ted Chen, vice president of marketing at Storage Dimensions in Milpitas, Calif.

However, he noted, "We see legacy systems staying on Ultra SCSI for some period of time, in the area of 12 to 18 months, because of the life expectancy of existing servers."



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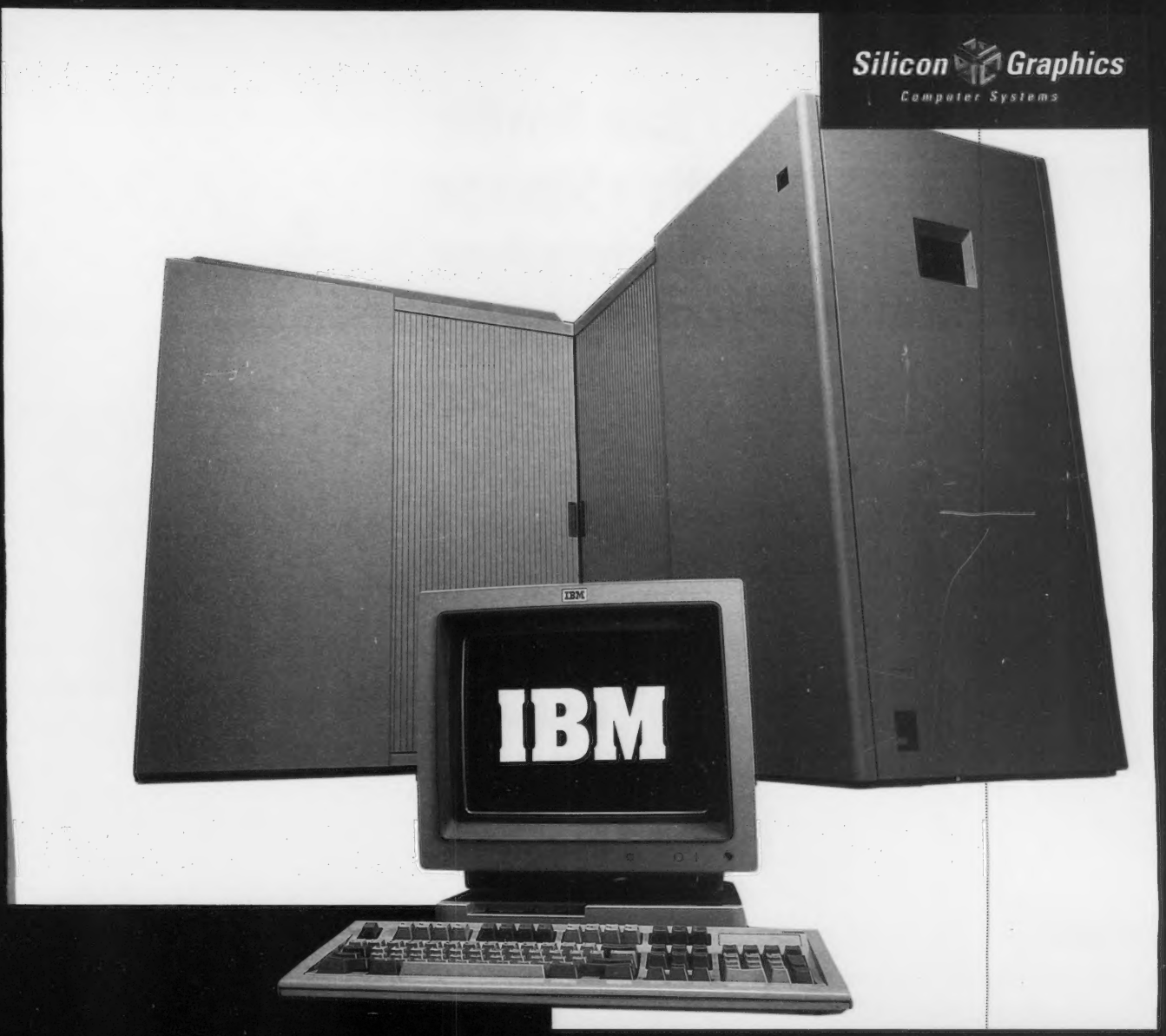
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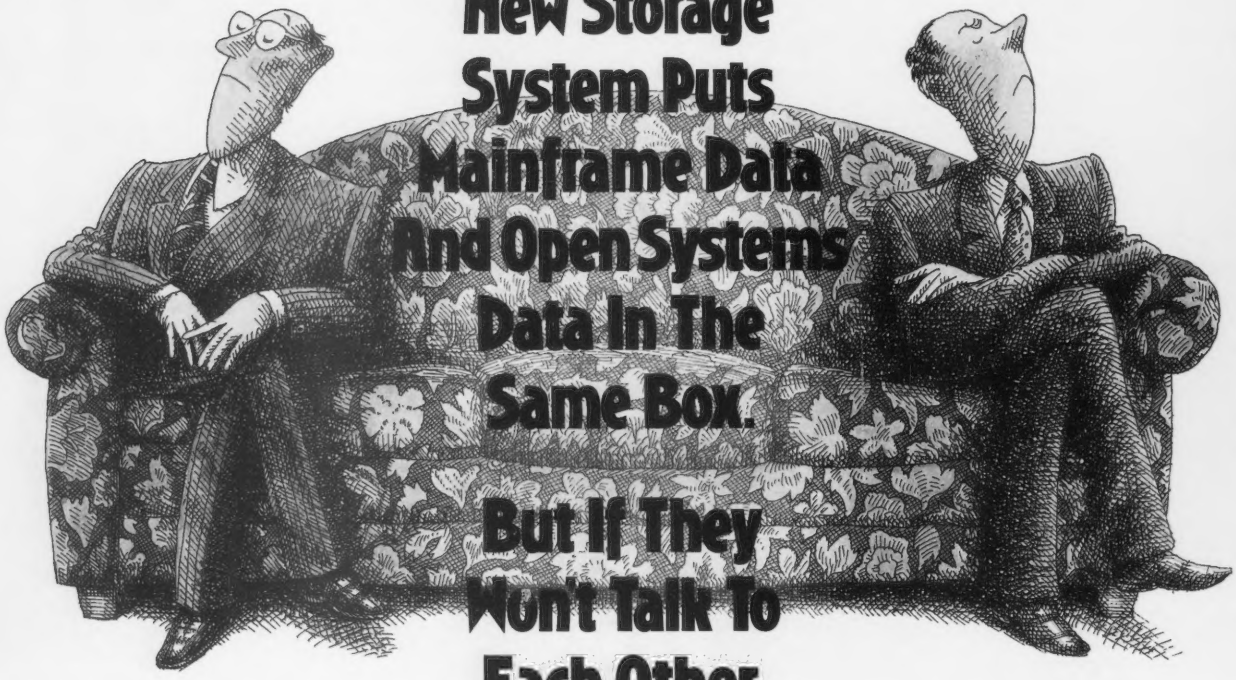
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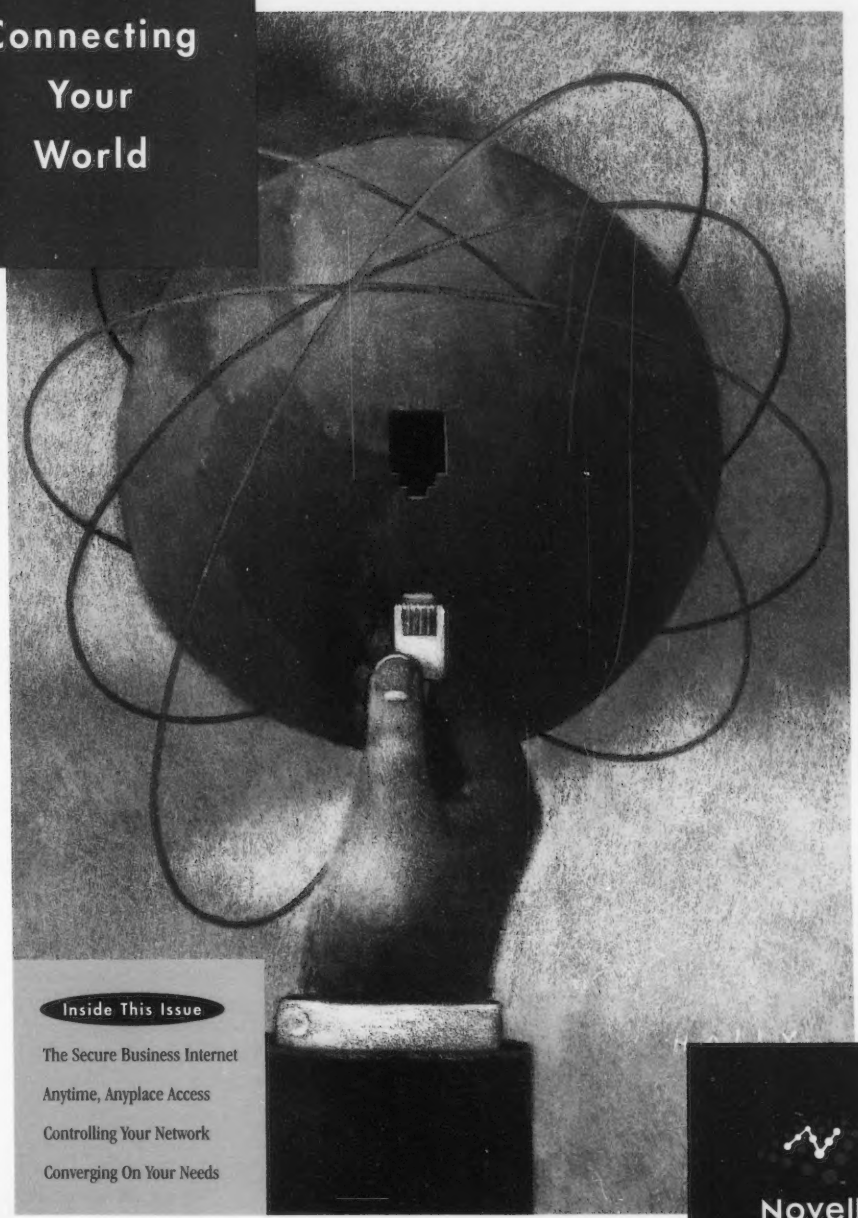
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Inside This Issue

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Building The Secure Business Internet

These days, there's a lot of construction underway on corporate information systems. Nowhere is this electronic building boom more evident than in wide-area networking. Literally millions of hours and billions of dollars are being spent this year as companies attempt to integrate the virtual corporation, address a global customer base and look for more efficient ways to market their products and services.

As the focus of computing continues to shift from desktop-centric to a balanced mix of smart desktops and smart network services, network software will play an increasingly important role. A secure business internet is essential to connect people with other people and the information they need—and give them the power to make the most of those connections—anytime, anyplace—or in other words, to deliver what Novell calls Pervasive Computing™.

Connecting to the secure business internet must be as simple as plugging your phone into the wall.

As computing becomes pervasive, people will be able to access and assimilate global data in real time, and communicate and collaborate in ways never before possible. Since digital currency will race across this network, every financial transaction must be delivered, tracked and accounted for in real time. Network security and firewalls must protect valuable corporate data from the outside world. A universal directory must automatically chauffeur you and your applications around the globe.

In essence, this new business internet must include many of the components and characteristics of today's Novell® NetWare® 4 networks: security, reliability and flexibility–with a robust global directory. Ultimately, connecting to it must be as simple as plugging your phone into the wall.

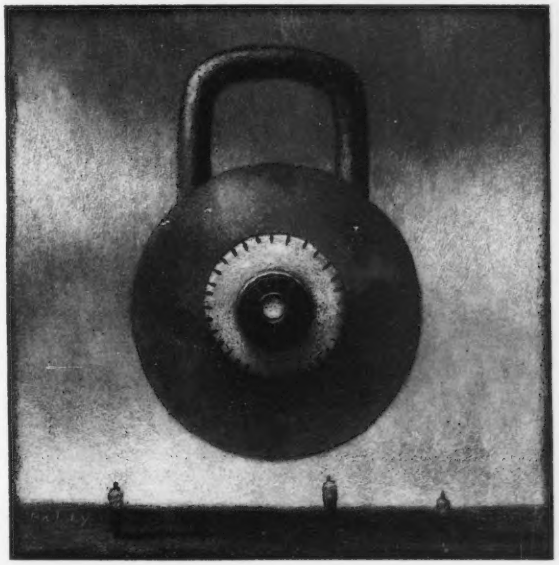
Reach Out and Touch the World

A powerful fusion of networking and telephone technologies will take place within months as Novell and AT&T launch AT&T NetWare Connect Services (ANCS). ANCS is the first public data network to incorporate NetWare Connect Services™ technology. It will revolutionize networking on a global scale by linking Novell NetWare LANs via the long-distance data services of AT&T, Regional Bell Operating Companies and telephone service providers throughout the world.

Thus, the most popular, most trusted network operating system will soon be integrated with the most popular, most trusted carrier networks–starting with AT&T. ANCS provides an information dial tone to easily access information and communicate using any device at anytime from anyplace. Similar to a telephone dial tone, this information dial tone will make accessing global data and network resources seem second nature.

The net effect will be a global, scalable, plug-and-play network with unmatched ease of use. It will be standards-based, with multivendor hardware and software working together as a cohesive system. Unlike traditional WANs, ANCS will provide your business with bandwidth on demand using IPX and TCP/IP protocols. Lastly, you will use as little or as much information access and exchange capability as the task requires. And pay accordingly.

Obviously, many companies will continue to require traditional Internet



services, so ANCS will provide direct access to the Internet and other online services without compromising ANCS security. Based on NetWare Directory Services™ (NDS™), ANCS maintains a one-network, one-directory structure with built-in security, so only authorized users can access proprietary business information and network resources.

Testing, Testing

AT&T and Novell are currently conducting ANCS market trials with several key customers. Ziff-Davis Publishing, a leading magazine publisher and content provider for online services, relies on ANCS to enhance collaboration with geographically dispersed writers and editors—all of whom need simplified access to corporate information and databases. Millard Refrigerated Services, a leader in cold storage and the largest producer of private-label bacon, uses ANCS to link headquarters, field locations and customers to an intercompany network that helps authorized users track inventory and cold storage availability. In addition, a Fortune 500 company uses ANCS to connect its outside sales force and other mobile users to a variety of applications.

While ANCS fulfills unique needs for each of these companies, all see the value in improving communications while outsourcing all or part of their wide-area network administration to AT&T. Put simply, they no longer must be burdened with building, maintaining and administering complex wide-area networks, servers or applications.

From the Desktop to the Net Top

To simplify the navigation and global access of network resources, Novell has developed Corsair™, a new technology that provides a client-server platform for building applications and services. The Corsair SDK offers a development environment to integrate technologies for navigating, accessing and browsing information on NetWare, ANCS and the Internet. Whether your business includes point of sale, manufacturing or providing services, your network interface must easily adapt to your work environment. The Corsair SDK provides applications with an easily customizable three-dimensional "virtual world" interface that requires no training whatsoever to use. It works with NetWare Directory Services to mask the complexity of the network, bringing you just the information you want, regardless of where it's located.

Developer kits are now available, allowing programmers to build this type of functionality—including custom interfaces—into a variety of Windows 95-based applications. Novell will also offer Corsair developer kits on Macintosh and UNIX systems, and is working with providers of operating systems for personal digital assistants to implement its interface on numerous other electronic devices.

Opening the Electronic Marketplace

Perhaps nowhere will the secure business internet enhance our lives more than in the electronic marketplace with new opportunities for businesses—and eventually—countless consumer products and services.

Novell is working with more than 50 Novell Embedded Systems Technology™ (NEST™) Partners to integrate NetWare technology into a wide variety of non-traditional computing devices—many of which will soon support the electronic marketplace. For example, General Instruments, the world's leading cable system provider, and Novell have already developed two-way systems that let users order video on demand; participate in distance-learning programs; download software; transfer multimedia documents; and check voice messages, faxes and E-mail.

Using intuitive interfaces, people can dial up their travel service, view real-time video presentations and book their next vacation. The list grows even larger when you consider the possibilities for electronic marketing, distribution and leasing of software. Ultimately, consumers will enjoy interactive shopping from the comfort of home. They will sift through video "mail-order" catalogs and make secure purchases electronically thanks to NDS and NetWare security features.

As computing becomes pervasive, a secure business internet will connect the entire value chain, improving communications, service and responsiveness. Moreover, it gives each of us the power to dramatically enhance our lives—both at work and play. But something this big won't come from one single company. That's why Novell is working with industry leaders to provide barrier-free access to information and communications for one billion individuals by the year 2000.

NetWare 4.1 is today's most powerful, scalable and flexible network operating system and the only one that delivers seven essential network services. It builds on the capabilities and 11 years of proven reliability of NetWare—the de facto standard for network computing. Based on industry standards, NetWare preserves your existing IT investment and lets you build a best-of-class enterprise network solution.

NetWare Directory Services, the global directory in NetWare 4.1, turns a multiserver network into a single, integrated information system that's easier to access and administer and less expensive to own, operate and maintain.

Services	Novell 4.1 NetWare	Microsoft NT Server 3.51	IBM LAN Server 4.0
Directory	■		
Integrated Messaging	■		
Multiprotocol Routing	■		
Network Management	■	Limited	Limited
Security	■	Limited	Limited
File	■	■	■
Print	■	■	■

Source: IDC, Novell 9/95



The Future of Networking . . .

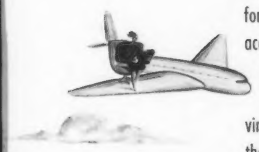
. . . Is Far From the Network



NetWare® Connect™ 2: Remote access to the future

A workforce on the move demands network connectivity solutions that go along for the ride. And for millions of NetWare users looking for the most road-worthy remote access solution available today—and the network managers responsible for keeping it all under control—Novell® introduces NetWare Connect 2.

With advanced new management and security features, NetWare Connect 2 is the smart solution for both inbound and outbound remote network access. Traveling executives, salespeople, field technicians and telecommuters can dial in and enjoy transparent network access from virtually anywhere. Users can also dial out to the Internet and bulletin board services, making NetWare Connect 2 the only remote access solution NetWare users need.



But network administrators are truly the biggest winners with NetWare Connect 2:

- A choice of four security schemes, for ironclad protection
- Enhanced real-time monitoring, reporting and troubleshooting
- Integration with NetWare Directory Services™ (NDS™) for the global user

With Netware Connect 2, you can provide users with the access they want without sacrificing the security, flexibility and manageability.

Take a look at the future of networking today by calling 1.800.501.4965 or 1.512.434.1519 for your free demo disk.

NOVELL®

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Anytime, Anyplace Access

People say it's a small world, but it sure doesn't feel that way for IS managers who must provide network access to roving bands of end users. Global economic pressures—and opportunities—are forcing companies to branch out and expand the range of their sales forces. The result: sales reps and mobile professionals are traveling more than ever before; closer ties to customers and suppliers are creating such tight bonds that some workers maintain offices in more than one company; and increasing numbers of people are going to work without leaving the house. According to the Yankee Group, a Boston-based market research firm, there will be 10 million telecommuters in 1996—up from just 3 million in 1993. And if that wasn't enough for IS to handle, workgroups are

> *The greatest challenge is to make computing as mobile as the people who use it.*

evolving into networked project teams spanning multiple continents. Team members not only need to access the network, they must also share documents and points of view in real time.

So, the greatest challenge is to make computing as mobile as the people who use it—providing all of the convenience, familiarity and unimpeded access to network resources that workers have come to expect from their desktop system. And that's a tall order, especially when you factor in the network management and security implications mobile computing creates. Since the trend toward global computing isn't likely to slow down anytime soon and caffeine will only take you so far, IS managers would be well advised to find a long-term solution.

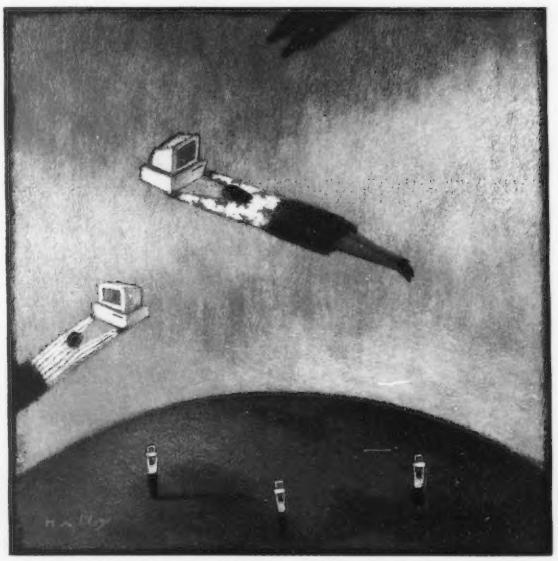
Keeping Pace with Mobile Users

Novell® products provide the framework for remote user ease of use and network manager peace of mind. NetWare® 4.1 is the open, scalable operating system that is flexible enough to accommodate an almost unlimited array of mobile computing solutions. With a single login, NetWare Directory Services™ (NDS™)—the global directory in NetWare 4.1—automatically links remote users to the information, applications and people they need.

But NetWare and NDS are only part of the story. Because both are so extensible, they are fast becoming the focal point for a flurry of imaginative add-on solutions from Novell and third-party vendors.

An outstanding solution for handling the upsurge in remote-user logins is NetWare Connect™ 2. This scalable remote communications platform lets up to 128 remote PC and Macintosh users dial in while retaining the same level of security as local NetWare clients. In fact, NetWare Connect lets you easily enhance NetWare security with automatic call-back and built-in firewall options. Local users can also dial out to access an Internet provider, or dial in to access a corporate Internet connection. More than just a modem pool, NetWare Connect can integrate communications links such as async, point-to-point protocol (PPP), X.25 and ISDN—plus multiple communications services such as E-mail—onto a single platform. It also includes tools to simplify remote connectivity management. Moreover, this cost-effective solution eliminates the need for dedicated modems and phone lines at every desktop.

Adding mobile intelligence is another key way to keep wandering users productive. Telecommuters, field sales reps and traveling



professionals will soon get a needed boost when NetWare mobile technology enables remote Windows users to take selected network data with them on their laptop computers, work offline and update the files once they reconnect. Mobile technology will let remote users easily set up location preferences, so their system understands where they are working, their preferred printer at that location and the appropriate phone numbers to dial into their NetWare network, for example. It also will provide a graphical-based administration tool, mobile printing capabilities and NetWare security for network and mobile data.

Network applications also streamline the process of remote access, and Novell provides some of the best. GroupWise™ Remote provides mobile users with full access to GroupWise E-mail, scheduling and task-management capabilities. Not only can users access their E-mail and schedule appointments over the phone with GroupWise, it also includes options for sending faxes, Internet E-mail messages or even mobile pager messages.

Bringing the Internet to Your LAN.

The popularity of the Internet should come as no surprise. After all, universal connectivity and easy-to-use information access services such as the World Wide Web are a pretty easy sell. But while this worldwide "net" opens many possibilities for global communications, it can also create management difficulties for network administrators. Installing Internet access software on every desktop and assigning IP addresses for each user can eat up valuable time. Moreover, there are some fundamental security issues to consider.

Novell provides seamless and secure Internet access products today and has the experience to develop leading solutions for tomorrow. Since the Internet is mainly composed of UNIX and TCP/IP, it represents an extension of the technology that Novell has already provided to hundreds of thousands of customer sites. In fact, Novell is the world's leading TCP/IP provider to the desktop and is applying its expertise in PC LAN-to-UNIX integration to bring the Internet to NetWare networks.

For example, LAN WorkPlace® is the industry-leading platform for connecting PCs to UNIX and TCP/IP-based networks and the Internet directly from the desktop. It features Netscape browser technology plus exceptional remote access capabilities. There's also LAN WorkGroup™, which offers the same functionality and user interface as LAN WorkPlace, while offering server-based installation and configuration. If you're providing Internet access to many users, installing from the server is a real time-saver. In addition, LAN WorkGroup lets you configure and assign IP addresses for each desktop, also from a NetWare server.

For an even higher level of UNIX network integration there's NetWare NFS Services, providing NetWare sites with DNS and FTP capability. Or, simply put, it makes NetWare files and resources available to UNIX users and vice versa. NetWare users access UNIX files as if they are native NetWare volumes. Likewise, any UNIX user can easily access NetWare resources from within their familiar environment. With both groups sharing each other's printers and peripherals, you maximize your investment in these devices. Equally important, this solution lets you manage both NetWare and UNIX user accounts from a single location.

Products such as LAN WorkPlace, LAN WorkGroup and NetWare NFS Services not only provide a greater level of functionality for accessing information within the company, but also enable enterprises to take the first step in connecting their internal information systems and remote users to UNIX hosts and the Internet in secure, manageable ways.

Networking Far and Wide: Integrating Branch Offices

Extending network access into the realm of anytime, anyplace information exchange is a wonderful concept in the abstract. However, when you're faced with the reality of integrating multiple branch offices into a manageable solution, even the best topology maps can at times resemble a Salvador Dali painting.

NetWare Connect 2 is a remote communications platform providing up to 128 simultaneous remote PC and Macintosh users secure, dial-in access to resources on a NetWare network. Dial-in resources include files, databases, applications, E-mail, printers and host computer services. With NetWare Connect, users of local PC and Macintosh workstations can use their favorite communications package to dial out and access online services and the Internet through the server-based modem pool. This scalable solution builds on the industry-leading security features of NetWare. It also leverages your network investment and eliminates the need for dedicated modems and phone lines at every desktop.

Feature	Novell NetWare Connect	Shiva LanRover/E PLUS
NetWare Directory Services-Based Security	■	
Multiple Security Firewall Options	■	Limited
Trend Analysis Tool	■	
Cost Accounting Tool	■	
Maximum Port Capacity Per Server	128	8
Additive Licensing Upgrades	■	
NLM-Based	■	
Uses Standard File Server, NIC, COM Ports and Modems	■	Limited
Dial-Out Call Restrictions	■	
Automated Call Scripting	■	

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Fortunately, it doesn't have to be that way. NetWare MultiProtocol Router™ 3 is the scalable, software-based routing solution that provides an inexpensive common platform for creating seamless LAN-to-LAN integration. For companies wanting to integrate branch offices running NetWare with their corporate IBM mainframes and AS/400 systems, for example, the ideal solution is NetWare for SAA working in tandem with NetWare MultiProtocol Router or NetWare Connect. NetWare for SAA is a set of NetWare Loadable Modules™ (NLMs™) that provides seamless host connectivity and are fully integrated with NetWare administration, security and management. If a branch office has only a few host users, or requires occasional access to the corporate host, NetWare Connect complements NetWare for SAA with a very affordable and easy-to-manage dial-up solution.

By building on the stability of NetWare 4.1 and its global directory, Novell provides branch offices with the flexibility to design and implement their own local IS solutions, while staying fully integrated with the enterprise as a whole via WAN links. However, if you prefer to outsource some or all of your WAN administration, Novell and AT&T will soon offer cost-effective options to do exactly that. In effect, AT&T NetWare Connect Services (ANCS) will bring all of the ease of use, security and manageability of your NetWare network to the WAN.

LAN WorkPlace is the industry-leading platform for connecting people and their Windows and DOS PCs to UNIX systems, TCP/IP-based networks, NetWare and the Internet. LAN WorkPlace includes a full suite of WinSock-compliant applications and Netscape Navigator, the world-class Internet browser and news reader. The LAN WorkPlace graphical dialer makes it easy for you to dial in from remote locations over standard phone lines. LAN WorkGroup offers the same functionality and user interface as LAN WorkPlace, while offering server-based installation, configuration, maintenance and management.

"Once again, Novell led the market for PC TCP/IP shipments in 1994."

—IDC Market Overlook, June 1995

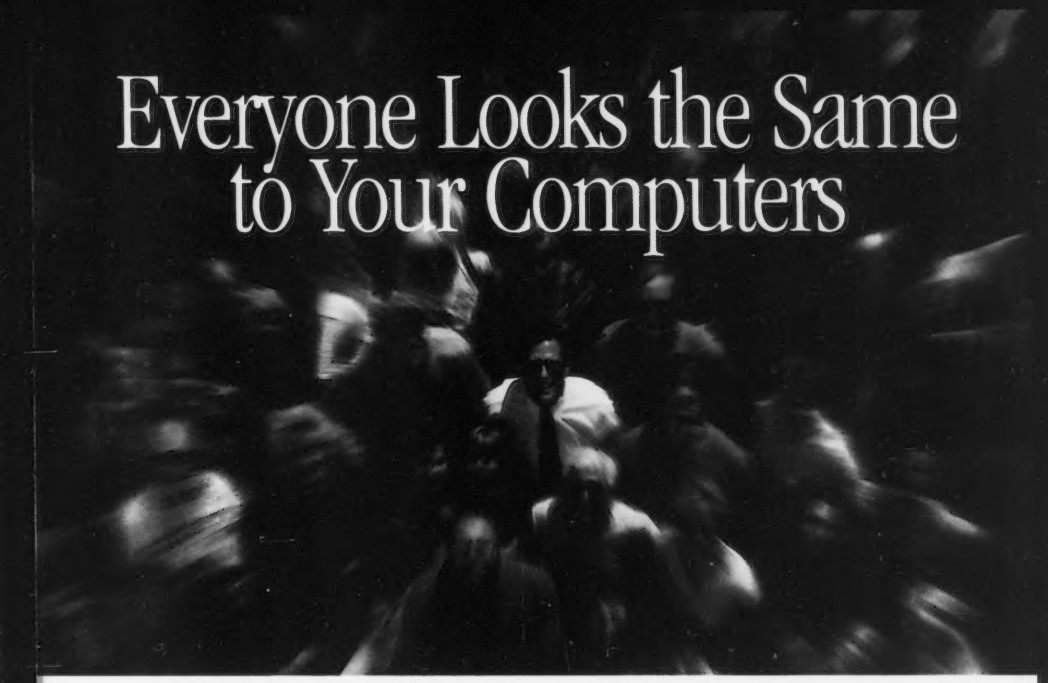
NetWare MultiProtocol Router 3 products provide unmatched branch office scalability, cost efficiency and NetWare integration across wide-area networks. This family of software-based routers operates on industry-standard PCs, providing a common communications platform for integrating NetWare MultiProtocol Router with best-of-class communications products such as NetWare Connect and NetWare for SAA. This affordable solution supports prevalent WAN protocols and substantially reduces the hardware, maintenance and administrative expenses associated with branch office communications.

	Novell NetWare MultiProtocol Router	Cisco 2500
Scalability (Ability to Add Services:)		
File & Print	■	
Hub Services	■	
Remote Access	■	■
RMON Agent	■	
SAA Gateway	■	
Expandability		
Ethernet/Token Ring	■	■
FDDI	■	
Fast Ethernet	■	
LAN Connections	24*	1
WAN Connections	16	1 or 2
Protocol Support		
TCP/IP—RIP & OSPF	■	■
IPX—RIP & NLSP	■	(Add'l cost)
AppleTalk	■	(Add'l cost)
Source Route Bridging	■	■
ISDN	(Add'l cost)	(Add'l cost)
Frame Relay, PPP, X.25	■	■
Hardware Platform	Standard Server or PC	Proprietary

Comparisons based on Novell's MPR BranchLink Router™ with WAN Extensions and Cisco's 2501/2502 platform with base software package as of 9/95. * Based on a six-slot chassis with four-port LAN adapters.

Taking Networking Where You Want To Go

Whether you're untethering mobile professionals from their desks, making branch users feel like they're just down the hall or bringing global information to people who need it, the right tools and expertise will make your job a lot easier. While some of these breakthrough technologies may sound like blue sky, they are actually firmly grounded in Novell technology as tightly integrated additions to NetWare 4 and NetWare Directory Services. As the world leader in networking, Novell will continue to provide both local and mobile solutions that enhance your company's IS capabilities—on a global scale.



Protect Your Network with *SafeWord*®

SafeWord knows your people, and Dynamic Passwords are the key. Every time an authorized user logs on to your network, Enigma Logic's SafeWord AS requires a new password that's good only once. No one can reuse it, not even you! Dynamic Passwords are more secure than conventional fixed passwords, and there's nothing to memorize.

Enigma Logic has teamed with Novell to provide comprehensive password protection for your network. SafeWord AS strengthens dial-in security on NetWare Connect and protects Internet and local logons to NetWare and UnixWare.

SafeWord's network authentication server features an *open architecture* that works with most popular Dynamic Password cards and the new SafeWord SofToken. You get the convenience of single database administration and the fault tolerance of automatic transaction mirroring.

Protect your entire network with SafeWord AS on UnixWare or NetWare. Install SafeWord clients on your Sun, HP, DEC, AIX, and other systems; or link it with a wide variety of communications servers, routers, and Internet firewalls for incomparable network security. Call Enigma Logic today!

800-808-1111

SafeWord – Taking Security to a New Level

yes NetWare

ENIGMA LOGIC INC



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SafeWord works with NetWare Connect 2 and runs on NetWare 3.12 or later and UnixWare 2.02 or later.

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Do You Have Control of Your Network?

There's no question that network computing enhances the way you do business. Through networking, you can access information at anytime from any place and communicate and collaborate with all members of the virtual organization—such as customers, consultants and suppliers—regardless of their location. Yet in the process of building a cohesive enterprise network, you've probably acquired enough systems, components and assorted computing paraphernalia to raise eyebrows at the offices of the *Guiness Book of World Records*.

It's a safe bet that you're constantly adapting your network to incorporate new technology and accommodate changes in your business structure. But as your network grows, so does the need to manage its infrastructure, services and applications. Since keeping your system running smoothly is probably your top priority, a close second should be finding a way to reduce the costs and complexities of network management. According to a Gartner Research Note, managing a network and supporting its users account for nearly three-quarters of ownership costs. Clearly, your business could use a way to simplify network management and reduce costs.

What Kind of a Network Do You Have, Anyway?

While these findings may seem discouraging, there's plenty you can do to save money and avoid the all-too-familiar network management fire drills. First, however, it's important to match your needs with an appropriate solution. Here are a few things to consider as you evaluate management options:

- *Is network downtime unacceptable at your company?*
- *Will your information system be growing?*
- *Besides desktop operating systems, do you also have devices from multiple vendors, such as file servers, printers, bridges, routers and hubs?*
- *Does your network include multiple NetWare servers?*
- *Do you manage remote users or geographically dispersed sites?*
- *Do any of your users require UNIX, IBM host or Internet access?*

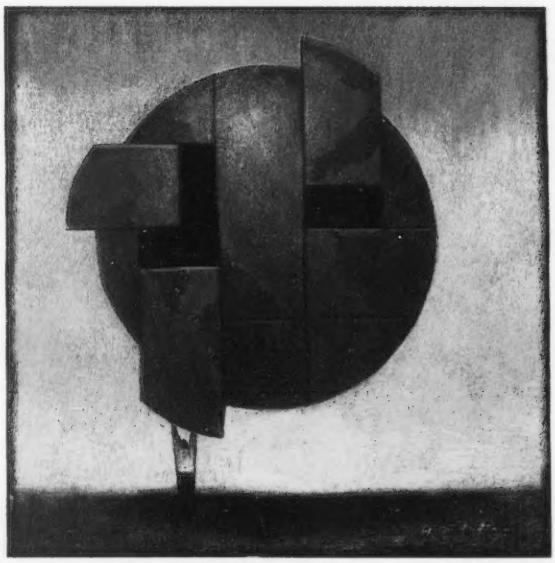
If you answered yes to several of these questions, you're not alone.

In fact, the overwhelming majority of today's networks include components from multiple vendors and must provide access to a growing number of distributed network resources. Yet, managing the broad array of hardware, software and network services doesn't need to be a daunting task.

For starters, make certain that your solution supports open industry standards to ensure compatibility and manageability of products from multiple vendors. For example, most every network device supports the Simple Network Management Protocol (SNMP). These devices might include servers, bridges, hubs, routers, printers and fax machines, to name a few, so it's important to be able to monitor and manage them using SNMP.

Regardless of the size of your network, you need to manage it as a cohesive system instead of a collection of devices. So beyond network administration and device management, you'll need tools for capacity planning, software distribution and storage management. Moreover, it must integrate with and enhance the capabilities of your network operating system's administration tools.

Perhaps the most strategic management decision of all involves the type of directory your management solution supports. A global directory such as NetWare® Directory Services™ (NDS™) lets you control distributed devices and services from a central location. If you support users and workgroups that must regularly reorganize, it's easy to see the benefit of that.



ManageWise: Integrated End-To-End Management

The solution that fits all of the above criteria is ManageWise™. This integrated end-to-end management solution from Novell® and Intel® manages NetWare servers, user desktops and the network infrastructure.

Equally important, ManageWise takes a proactive approach to network management, making surprises the exception rather than the rule. For example, ManageWise can continually check for viruses to prevent catastrophic failures. Common-sense installation and a straightforward graphical interface make it very easy to learn and use.

Take Charge Without Getting Out of Your Chair

Managing a myriad of systems shouldn't require running laps around the office to get your daily tasks accomplished. From your office, ManageWise automatically discovers network resources, letting you control them even when they're spread out all over the map. Not only can this approach save you the costs of placing network administrators at every location or branch office, it also means you won't be hopping on a plane just to track down a printer problem in Siberia. ManageWise distributes intelligent agents that monitor the system from end to end, warning you of potential problems before they occur. For example, if a segment experiences unusually high traffic or a server runs low on memory or disk space, you receive fair warning, along with suggestions on how to avoid these problems. The ManageWise console easily charts data for trend analysis, to spot and prevent future bottlenecks, as well as plan for growth. Add Novell's NetWare Navigator™ software and you can easily deploy or update software on each user's desktop, also without leaving your office.

In addition, ManageWise supports more than 100 third-party snap-in applications for routers and hubs from companies such as Cisco, 3Com, Bay Networks and Cabletron, to name a few. Novell's ConnectView™, another snap-in application, simplifies management of remote-user connections. And if you run an IBM host, NetWare for SAA Services Manager adds more powerful capabilities to ManageWise. ManageWise also provides vital information to other management consoles such as IBM SystemView for AIX and HP OpenView.

To proactively manage a multivendor system, components must communicate with the tools that manage them. That's why ManageWise supports industry standards such as IPX™, TCP/IP, AppleTalk, SNA, RMON and SNMP.

ManageWise is an integrated set of management services that monitors and controls the network from end to end, including user desktops, servers and the network infrastructure. ManageWise is the first solution that manages the network as a system, rather than as a set of independent devices. ManageWise detects network problems early, enables proactive network planning and ultimately increases business productivity.

The primary capabilities include: NetWare server management, desktop management, remote control, distributed network analysis, router management, hardware and software inventory, virus protection, print management and an integrated SNMP-based console.

Feature	Novell ManageWise	Microsoft SMS 1.0
Server Management	■	
Network Management	■	
Desktop Management	■	■
Network Virus Protection	■	
Software Distribution	Add-on	■
Network Discovery/Mapping	■	
Supports SNMP and RMON Standards	■	
Interoperates with Enterprise Management Consoles such as OpenView and NetView/AIX	■	
Deployed on Existing NetWare Servers, Saving Money	■	
Number of Third-Party Applications Available	Over 100	Fewer than 5

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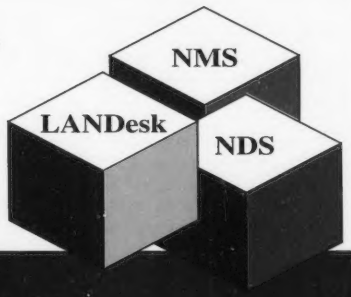
Should You Manage the Network Yourself?

We're halfway through the decade of downsizing, so it probably comes as no surprise that outsourcing is paying off for many people. Some small businesses don't need a full-time network administrator; medium-sized organizations may not want to maintain a help desk; and larger companies with specialized needs, such as automated manufacturing facilities, may opt for an outside technical service provider. Even multinational corporations are contracting out all or part of their network management needs. Outsourcing these services can give companies the opportunity to focus on their business issues rather than managing technology. Besides, it's getting more cost-effective all the time. A third-party provider can handle end-to-end network management with ManageWise just as easily from an external site as you can from your office. And, with secure business internets such as ANCS, outsourcing network management may soon become the norm.

Networking is helping people share resources and information beyond what anyone could have imagined just a few years ago. And now that network management tools and infrastructure are catching up, the overall cost of networking is coming down.

Novell and Intel Join Forces To Give You ManageWise, But...

- Each has its own distinct network database.
- Network information is all scattered among Novell's NDS, NMS, and Intel's LANDesk.
- They leave you to struggle with different user interfaces.



SyncComplete

The Unique Solution...



for ManageWise

Real Integrator for NMS & LANDesk
Smartly consolidates the data from Novell's NMS, NDS, and Intel's LANDesk into an integrated database and provides a common user interface that allows instant access to complete network information.

Integrated Database
Synchronizes data for complete network information and provides a user-centric view of your network.

Extensive Reporting Capabilities
Fully supports our ReportComplete, a network reporting tool which comes with SyncComplete. It generates predesigned reports for networks of any size; generates more than a dozen types of reports that fall into four report styles: Segment Report, Network report, Alarm Report, Router & Hub Function Report; provides different reporting styles that allow you to customize reports to your needs; comes with many reporting features that make generating reports easy.

System Auditing Capability
Automatically logs any configuration changes to the workstations and servers on your network. It allows you to keep track of all the changes and enables you to respond to any unauthorized changes before any problem occurs.

Automatic Data Input
Automatically fills the data into the NMS database and eliminates hours of manual data input.

Automated Operations
Allows scheduling for automated operations at certain times when network traffic is not at peak, or to schedule routine operations in a daily, weekly, biweekly, monthly, or even quarterly basis.

Two Levels of Data Synchronization
Provides two levels of data integration to meet your needs at different times: full synchrony and incremental synchrony. Full synchrony is a database rebuilding process that enables complete data integration among the NMS, NDS, and LANDesk databases. Full synchrony is recommended when the NMS database has been reset with all the data rediscovered. Incremental synchrony updates the object in the database when modification has been made.

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Converging Upon Your Needs

It's no secret that technology convergence has shifted into high gear. Voice, data, cellular, cable—even non-traditional computing devices such as home electronics—are accelerating toward a common destination: the network. When we link these diverse technologies via intelligent network services, they become universally available, increasing their value in exciting new ways—for businesses and consumers alike.

Calling All Computers

If we measure a technology's worth by how much people depend on it, then telephones and computers are priceless. And, while they tend to increase our productivity, at times they can also be counterproductive and frustrating. So it's easy to see why Computer-Telephony Integration (CTI) is such a hot topic today.

If you've made an airline reservation or booked a hotel room recently, chances are the agent you spoke with used some form of CTI to link your call to relevant data displayed on a monitor. By instantly accessing your billing information and personal preferences, agents save time and money. Likewise, you spend less time on the phone, which translates into lower long-distance charges and reduced labor costs. In fact, many companies that use CTI report productivity gains and cost savings of 15 to 30 percent compared to other call systems. Equally important, with CTI, agents are free to listen to customers and better serve them.

Computer-telephone integration isn't new, so why is it suddenly such a big deal? Until now, only the Fortune 500 could afford to build custom CTI systems. Fortunately, new products are removing price barriers, making the benefits of CTI affordable to companies of all sizes. These products include inexpensive telephone switches equipped with CTI links and middleware that tie current applications to telephone services. The other key component is NetWare® Telephony Services™—intelligent software that coordinates all of these components, links network services to telephone services and routes voice and data traffic.

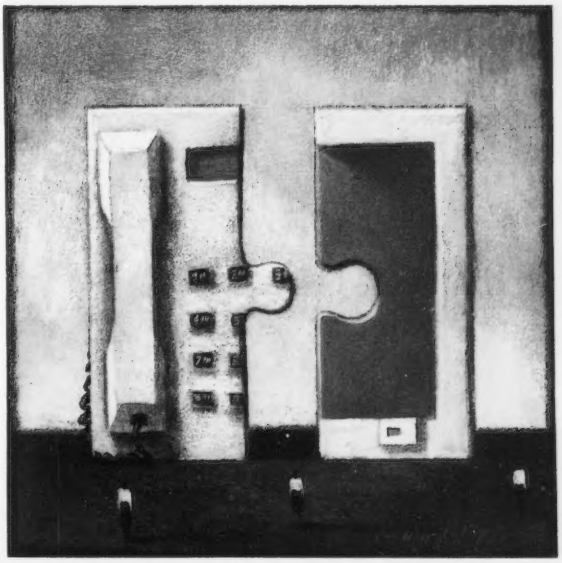
Hello, NetWare Telephony Services

NetWare Telephony Services is the industry's leading CTI platform. This affordable solution integrates the services of your NetWare network operating system with the functionality of a telephone PBX. Thus linked together, telephones and personal computers share information and enhance each other's value. Because NetWare Telephony Services operates on a NetWare server, you probably own most of the equipment required: a phone system, your LAN and business applications.

A network telephony model is the optimal way to get the most of shared data and phone resources. Calls are handled as they arrive in the phone system, not after they are terminated at the desktop. For example, when you're on your phone and an incoming call arrives, the call can be processed automatically. You might be notified that you have another incoming call and even know who it is. Or the call might be transferred to someone else based on a set of user-defined rules. In a desktop model, the incoming call cannot even be detected because the telephone line is busy. You must also install phone system-specific hardware on every workstation. In other words, the desktop model results in lost productivity and replicated resources. NetWare Telephony Services, on the other hand, lets you add one card on the server and never miss a call.

Of course, there's also the issue of administering this merged system. Since NetWare Telephony Services supports NetWare Directory Services™ (NDS™), adding users, changing phone numbers and ensuring secure access can be easily automated. Conversely, a desktop model places the burden of administration with each individual desktop user.

Many companies are looking for cost-



effective ways to outsource network management. NetWare Telephony Services makes it possible for a caller ID-equipped support center to route calls to the appropriate service representatives. As they answer the phone, their monitors display pertinent information such as who is calling, the level of training they've received and a history of their previous service calls. By integrating this system with Novell's ManageWise™ network management system, the service representative can launch the ManageWise console for the caller's network, and quickly view the entire system. Affordable applications of this type are available today for NetWare Telephony Services.

Novell is working with key partners to develop additional NetWare-enabled telephony applications to improve personal productivity. For example, by taking advantage of NDS and a scheduling solution such as GroupWise™, you'll be able to schedule a conference call by selecting participants' names from the global directory. After confirming everyone's schedule, the application will automatically dial up all participants with a click of a button.

Other third-party applications will soon allow you to easily define the priority of incoming calls. Let's say you're waiting for essential information or a call from your boss while working on a deadline. An application will let you specify which calls should ring through and automatically direct other calls to appropriate coworkers or your voice mail. For those times when you're mobile and must remain available to a select few, an application can track you down, automatically forwarding selected calls to your wireless set or cellular phone, or sending a message to your pager notifying you that a caller is holding.

It's worth noting that most of these powerful capabilities are possible only using a network-telephony model.

All Roads Lead to NetWare

Major computing advancements have been known to originate from the garages of industry pioneers. So it shouldn't surprise you to learn that Novell is working with a major automobile manufacturer to put a network link in your garage for your car. The technology is called Novell Embedded Systems Technology™ (NEST™)—another area of convergence that links non-traditional computing devices to the network. NEST will make it possible for cars and trucks, using built-in computer chips, to alert their owners that a system needs attention long before it fails. In fact, if the owner chooses, the vehicle itself can automatically E-mail diagnostic information to a dealership's service department to schedule vehicle repairs and maintenance.

NEST is extending network access beyond computers to include a growing number of non-traditional computing devices. Working with more than 40 leading manufacturers in industries as diverse as office equipment, vending systems, environmental controls, telecommunications and cable systems, Novell is networking "intelligent devices" of all kinds—virtually any device with a microprocessor and 50 kilobytes or more of memory. Once connected to the network, NEST-enabled devices provide intelligent access points to a wealth of global network resources.

Many businesses already realize immediate benefits of NEST as leading manufacturers add network intelligence to fax machines, copiers, scanners and telephones. A new product called NEST Autoroute™ enables faxes to be sent, duplicated and distributed over LANs, WANs and telephone lines, reducing costs dramatically. An office in New York, for example, can send one transcontinental fax to Tokyo, where an Autoroute-enabled fax machine forwards the fax to multiple Japanese locations.

NetWare Telephony Services and NEST are good examples of what Novell people mean when they talk about a future where NetWare is everywhere. These technologies are essential building blocks that will help the company reach its goal of the one-billion-user infrastructure called Pervasive Computing.

NetWare Telephony Services—the industry-leading computer-telephony integration (CTI) platform—efficiently unifies existing voice and data business solutions to enhance the value of both systems. Based on Telephone Services API (TSAPI), NetWare Telephony Service is an open programming interface that's supported by the top 24 PBX and key system switch manufacturers, plus over 100 independent software vendors. Applications enabled by NetWare Telephony Services include desktop dialing, help desk, interactive voice response, voice mail, unified messaging systems, custom call control systems, and agent and call activity reporting applications.

	NetWare Telephony Services	IBM CallPath	Microsoft TAPI
Requires Special Hardware on PCs			■
Personal Telephone Services	■	■	■
Network Telephone Services	■	■	
Expanded Server Applications	■	■	
Multiple Client Support	■	Limited	
Directory Services	■		
Network Management	■	■	
Broad Range of Applications	■	■	
International Telephone Standard	■		

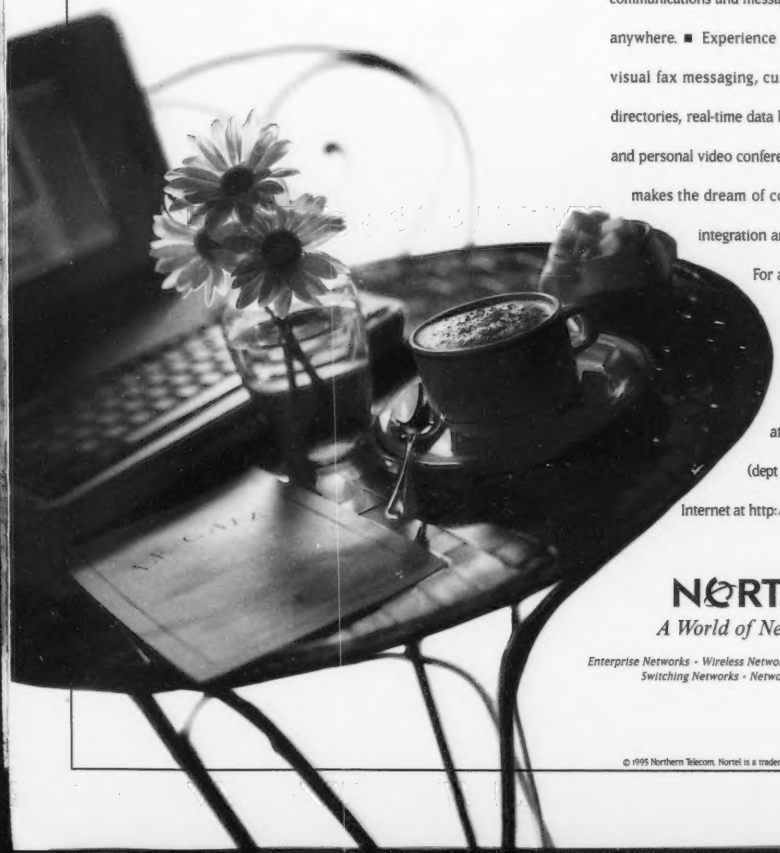
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Apple networking greatly improved, customers say

Open Transport eases Mac users' connection to other networks

By Lisa Picarille

For years Apple Computer, Inc.'s networking was considered nonexistent. Now the company's networking efforts are going into OT. No, not overtime but rather Open Transport — Apple's new underlying networking and communications architecture.

Macintosh issues

Apple's strong desire to be a player in the lucrative enterprise market has forced it to beef up its connectivity efforts. As part of the Cupertino, Calif., computer maker's "stand out, but fit in" strategy, Apple now supports almost every networking protocol through Open Transport (OT). The architecture includes a set of industry standard application programming interfaces (API) to ensure that networking hardware and software will run under OT.

This should result in a broader selection of networking hardware and software choices for Macintosh users and make it easier for them to connect to non-Apple networks.

And because OT has been built from the ground up to run native on the PowerPC, it also gives Power Macintosh users faster speeds over the network. Previously, AppleTalk and MacTCP were running in emulation on the Power Macintosh.

In particular, this is expected to significantly benefit Apple's core customers in the publishing and graphics industries, who often transfer extremely large files over the network.

Sold separately for now

OT runs in conjunction with the latest version of Mac OS, System 7.5.2, and is sold as a separate software package. It will continue to be distributed as a separate application, but Apple plans to build OT into Copland, or Version 8.0 of Mac OS, which is due out by the end of 1996, according to Richard Ford, Apple's TCP/IP product manager.

Currently, Apple is focusing on OT 1.0, which streamlines the process of connecting to other networks, improves data transfer speed and increases the number of users that can be on a single network. Version 1.0 ships with AppleTalk and TCP/IP networking protocols and works only with Apple's new Peripheral Component Interconnect (PCI)-bus Power Macintoshes. These models include the 9500, 8500, 7500 and 7200 lines.

However, OT Version 1.1, due out by year's end, will add backward compatibility by including support for NuBus Power Macintoshes — the 8100, 7100, 6100 series — and older Macintoshes that use Motorola's 68030 and 68040 processors. In an attempt to offer connections to an even wider variety of enterprise networks, OT 1.1 will also include support for additional networking protocols such as Novell, Inc.'s IPX, Point-to-Point Protocol (PPP) and X.25.

Public reaction

Although five users contacted last week said they were excited about the connectivity improvements offered by the OT technology, some will wait until Version 1.1 before implementing it.

"Ultimately, Open Transport will be very cool, but I'm not ready to jump into it yet," said Mike Bailey, a systems analyst at Lockheed Martin Missiles & Space in Sunnyvale, Calif., which has more than 6,500 Macintoshes and 2,300 PCs. Bailey said he is waiting for a handful of minor problems with OT 1.0 to be worked out.

Since it became available in August, OT has run into some minor glitches when working with certain third-party applications. OT Version 1.0 was also optimized specifically for 10M bit/sec. built-in Ethernet so some of the 100M bit/sec. "fast" Ethernet cards built for the PCI bus in the Power Macintosh 9500 line run at unacceptably slow speeds.

Rose Parkhill, network manager in the information services department for the city of Longview, Wash., said she doesn't plan to implement OT until it supports a wider variety of Macintoshes.

"At that point it will be almost hardware-independent, and we won't have to worry which systems it will or will not work with. It'll just work," Parkhill said.

New image emerges

Even as Macintosh users eye OT from the sidelines, they are starting to change their previously negative tune about Apple's network support. But the loudest applause seems to be coming from users with all-Macintosh networks.

"In general, their networking stuff is really good," said Mark Munro, a corporate Macintosh network manager at the New York office of Jack Morton Productions, Inc. The firm specializes in creating corporate training materials and has more than 150 Macintoshes and a handful of PCs. "Mac networking is easy for the administrators and the users, which makes it cheaper to use and support."

"Apple-to-Apple connectivity is the best in the industry," said Brian Comnes, manager of information center technology at DHL Airways in Redwood City, Calif., which has more than 700 Macintoshes.

Apples to whatever

Open Transport (OT) is Apple's new underlying networking architecture. OT is currently available as a separate software package, but late next year when Apple delivers Copland, its next-generation operating system, OT will be built into Mac OS.

Product	OT 1.0	OT 1.1
Platform supported	PCI bus Power Macintosh (9500, 8500, 7500, 7200)	NuBus Power Macintosh (8100, 7100, 6100); Macintoshes with Motorola 68030 and 68040 processors
Hardware supported	AppleTalk, TCP/IP	Novell IPX, PPP, X.25
Availability	Now; free upgrade to System 7.5 and MacTCP users	By end of year

Apple's Open Transport networking and communications architecture:

- Supports almost every networking protocol.
- Built to run on the PowerPC.
- Industry standard APIs ensure networking hardware and software run under it.
- Makes it easier for Macintosh users to connect to non-Apple networks.
- Helps core customer base in the graphics and publishing industries transfer extremely large files over the network.

Imaging costs corralled by insurance firm

By Thomas Hoffman

Insurance administrator Oswald Risk Management Services Co. wanted a high-end image processing system, but it didn't want to spend a lot of money.

Like other players in the insurance industry, Oswald Risk saw image processing as a way to help streamline its record keeping and claims processing.

Cleveland-based Oswald Risk is a third-party administrator for state fund workers' compensation claims in Ohio. It handles 6,000 to 7,000 claims annually, and some of its most extensive claims require up to 400 pages per case.



Oswald Risk manager *Lisa Gilhousen can fax original documents directly from her workstation*

Too much, not enough

But the price tag for a typical imaging system was more than what Oswald wanted to pay, and functionality was less than it required.

"The kind of pricing I had seen for one- or two-workstation systems was $250,000 and up. They were very capable systems but not scaled to the 20-station system we needed," said Frank McCollum, operations manager.

After an exhaustive search, Oswald Risk decided upon Westbrook Technologies, Inc.'s FileMagic software, a Windows 3.1-based system that cost $130,000 when it was installed in December 1993.

That $130,000 also bought 20 66-MHz 486-based workstations with 8M bytes of RAM, a Hewlett-Packard Co. HP 5/60 LM network server, an HP Model 20 LT Optical Disk Library, a Fujitsu Ltd. scanner and a Novell, Inc. NetWare 3.12 network operating system.

Oswald Risk's FileMagic system has been a real time-saver. In the past, employees in the company's state fund department, where the system is used, spent up to five minutes searching for a worker's compensation claim in the company's file room. Now, by typing in a person's name, a claims agent can retrieve a file within a few seconds.

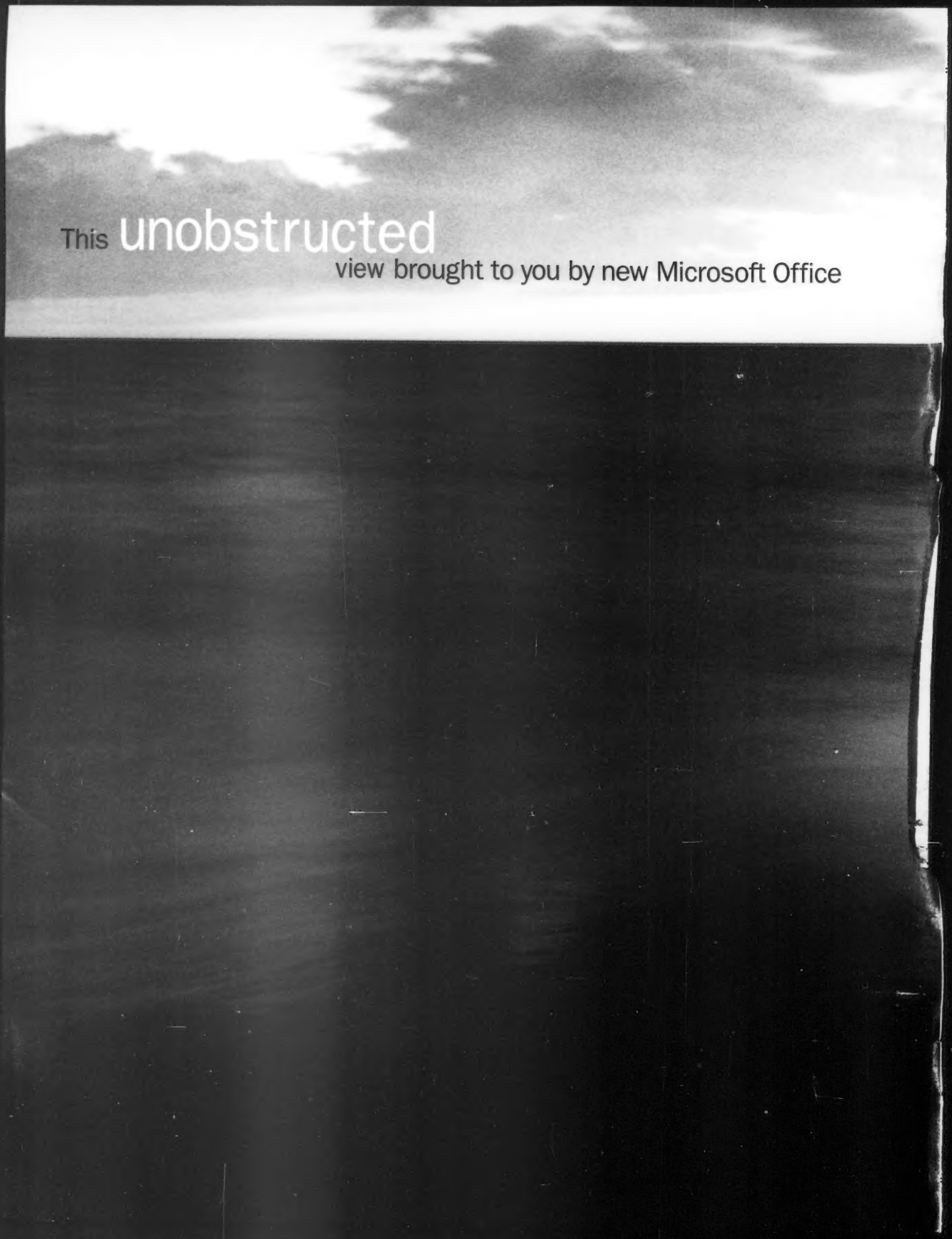
Plus, agents can fax original documents to third parties directly from their workstations, a feature that is built into the FileMagic software. "That's a big time savings since I no longer have to print it out and fax it off," said Lisa Gilhousen, manager of Oswald Risk's state fund department and an end user of the system.

In the past two years, the company has boosted its server memory from 24M bytes to 96M bytes, but the $3,600 it spent to do that is still considerably less than it would have spent for a comparable system, McCollum said.

Indeed, claims processing applications can become fairly complex once they're integrated with legacy insurance applications. As a result, the complexity of these configurations — combined with high transaction rates — help drive up the per-seat cost of imaging systems, according to Connie Moore, director of workflow, document and imaging strategies at BIS Strategic Decisions in Norwell, Mass.

Six of a kind

Ohio is just one of six "monopoly" states that require private sector companies to buy workers' compensation insurance through the state. The others are Nevada, Wyoming, North Dakota, Washington and West Virginia.


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Commentary

Jean S. Bozman

Unix thrives at high end



Is Unix dying?

Decidedly not. Just look at the latest market figures, which show Unix server sales growing at more than 40% a year, and workstation sales clipping along at a more modest 20% annually.

Yet with all the hype about Microsoft's Windows 95 and Windows NT these days, one would think systems vendors would be better off throwing in the towel on Unix.

The truth is that Unix systems have become firmly entrenched in the mainstream. There, they support the lion's share of relational databases sold for midrange servers as well as hundreds of end users per machine. At the high end, Unix has definite advantages over Windows NT in terms of scalability and the availability of networking "hooks" to interoperate among many platforms.

But Unix is also decidedly not sexy. It hasn't triumphed in marketing or popularity spheres.

At last week's Unix Expo '95 in New York, systems vendors were trying hard to show that there's room for both NT and Unix in the enterprise.

Digital executives, for example, emphasized that while NT may serve certain purposes for workgroup computing or power desktop use on Alpha workstations, users still need Unix for that big Oracle server with the 64-bit operating system and 8G-byte database.

Still, there's a strong undercurrent in large corporations to unify electronic-mail systems — often under Microsoft Mail — and to exchange documents created with Microsoft applications.

Even engineers who are fond of their Unix machines say they've become frustrated by having to log on to PCs to get their corporate E-mail while sipping their cup of coffee each morning. Many large companies have already moved to Windows-based PC clients with Unix servers running corporate applications and databases.

Burden falls on vendors

The open systems vendors must shoulder most of the blame for Unix's poor image. Unix never did live up to its claims of easy portability between platforms, particularly because vendors such as Sun, IBM, Hewlett-Packard and Digital raced to add bells and whistles to their own "flavors," or variants, of Unix. Neither did the vendors live up to their claims of fraternity in the face of Microsoft's head-on competition, except for devising a unified set of application programming interfaces.

And while they were fiddling, NT started burning up workstation sales, which nearly doubled from 1994 to 1995, according to International Data Corp. (IDC).

The market snapped up about 500,000 NT units worth some $2.5 billion. In contrast, about 1 million Unix workstations, worth about $14.2 billion, will be sold this year, IDC projects.

But even as Windows 95 works up a head of steam on corporate America's desktops, NT can't keep pace with Unix scalability. That will become increasingly important at the high end as companies replace aging mainframes with Unix servers in the late 1990s.

Today, NT can't scale well past four processors, although that is supposed to change next year with the appearance of Intel P6-based machines. By contrast, Unix can scale well to 32 or even 64 CPUs.

The high end holds the most promise for Unix because NT can't hope to compete there for several years.

NT's greatest threat to Unix now is in workgroup servers. The land of Novell's NetWare is where NT aims to make its first stop, getting its grounding in network connectivity before moving on to high-end servers.

But vendors such as HP and Digital already see the point: The enterprise can't wait for NT to grow up. It still needs high-end servers to replace mainframes.

So despite the rapid buildup of NT servers, many vendors are hedging their bets on Unix and NT and selling both systems. Even as they package NT with their Intel-based PC servers, they are building midrange and high-end Unix servers to scale to the highest reaches of the enterprise.

Unix has what amounts to a 25-year head start on NT, which will grow up to be a fully enterprise-ready operating system for host servers — once Microsoft and its business partners are through enhancing it. Until then, the enterprise needs NT and Unix, not one or the other.

Bozman is *Computerworld*'s senior editor, open systems. Her Internet address is jean_bozman@cw.com.

Briefs

Printing made easy

In planning its new line of multifunction imaging products, **Ricoh Corp.** in San Jose, Calif., will use network printer server interfaces from **Emulex Corp.** in Costa Mesa, Calif. Emulex's technology will allow users to access the machines — combinations of copiers, fax machines and scanners — simultaneously from various network operating systems.

New unit from Siemens

Siemens/Nixdorf USA in Burlington, Mass., said it has started a new Integrated Storage Systems unit to launch a set of open systems storage products for computer resellers and systems vendors. The family of storage systems is designed to work with PC LANs, Unix platforms and mainframes, the company said.

Tory resigns from the OSF

Open Software Foundation (OSF) Chief Executive Officer David Tory has resigned from the 6-year-old Unix standards organization in Cambridge, Mass. No reason was given for Tory's resignation, effective Sept. 15. A former Computer Associates International, Inc. executive, Tory headed the OSF since its inception in 1989. He oversaw the OSF's downsizing from 350 employees to 200 employees worldwide from 1994 to 1995.



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Briefs

Sybase stats

Platinum Technology, Inc. in Oakbrook Terrace, Ill., has shipped its DBVision for Sybase, which monitors performance of Sybase, Inc. System 10 relational databases in distributed computing environments. Performance statistics collected by the DBVision product can be shown in graphical form, allowing database administrators to spot slowdowns and correct them. Prices start at $8,000 for the basic DBVision management console. Additional DBVision software components are priced from $2,800.

Network General adds to Unix

Network General Corp. in Menlo Park, Calif., will acquire privately held **AIM Technology** in Santa Clara, Calif. The two companies had previously announced a product integration partnership [CW, Dec. 12, 1994]. They now plan to enable users to combine network and system information from their products to help manage distributed Unix systems.

Legato teams up on storage

Imagery Software in Bedford, Mass., and **Legato Systems, Inc.** in Palo Alto, Calif., have announced a partnership. Under the partnership, Imagery's hierarchical storage management (HSM) product, GroupStore HSM, will be integrated with Legato's NetWorker archiving and backup software. Pricing and availability information was not available.

CDE project kicks off

The **Open Software Foundation** (OSF) said it has formally launched the vendor-sponsored project that will develop the Common Desktop Environment (CDE) that unifies all vendors' Unix desktops. The same multivendor effort will combine CDE with the organization's Motif user interface — and provide a follow-on to the current CDE 1.0 by 1997. Sponsoring vendors are IBM, Hewlett-Packard Co., Digital Equipment Corp., Novell, Inc., Fujitsu Ltd., Hitachi Ltd. and SunSoft, Inc.

PowerLites get price cut

RDI Computer Corp. in Carlsbad, Calif., said it has cut prices for its **Sun Microsystems, Inc.**-compatible portable computers by as much as 60% to provide better a price/performance ratio than its competitors. The new base prices for RDI Computer's PowerLite series will range from $5,950 to $12,995.

Unix, AS/400 connection

IBM signed a deal to jointly develop a series of Unix-to-AS/400 connectivity products with **StarWare, Inc.** The two companies are cross-licensing their existing products for connecting Unix systems to AS/400s. They are also co-developing new features that will be combined into a single offering. Both plan to market the integrated products, which are scheduled to ship sometime next year. StarWare, based in Berkeley, Calif., also said its StarSQL software for accessing IBM databases now supports both SNA and TCP/IP networks via IBM's AnyNet technology.

IBM

CONTINUED FROM PAGE 53

push data about the process into a Notes database.

While IBM grapples with a solid strategy, Microsoft Corp. and Novell, Inc. have already announced their workflow plans. Microsoft will develop workflow application programming interfaces (API) for its MAPI messaging architecture. Novell has a development agreement with workflow market leader FileNet Corp. to integrate workflow with its groupware.

One factor in IBM's favor is that Flowmark is strongly object-oriented, analysts said. It was developed exclusively for client/server systems. One Flowmark user said she was impressed with its enterprise management capabilities.

"I like the ability to integrate many organizational components," said Yvonne Antonucci, assistant professor of MIS at Widener University in Chester, Pa. She said she especially likes being able to manage the process and people together, as opposed to having to manage them individually.

Limited reach

But, in the eyes of non-IBM shops, the product suffers from a lack of platform support. Flowmark's workflow server component runs only on OS/2 and AIX, IBM's version of Unix.

"The minute people see that you are not supporting the platform is the day they get nervous, even if they aren't planning to buy it" on that platform, McCready said.

IBM plans to go beyond its own operating systems, Sullivan said. "We will be extending to other Unix platforms in particular, and another platform we are seeing as a requirement is NT," he added. But IBM hasn't committed to a time frame for supporting these platforms.

"Unless I see some major changes in how IBM sells Flowmark, it will remain attractive largely to IBM shops," said Sally DeJean, a consultant in Newton, Mass., and secretary/treasurer of the Worldwide Association of Lotus Notes Users and Technologists. "They will have to prove Flowmark is better integrated with Notes and easier to implement without driving everybody bananas," she added.

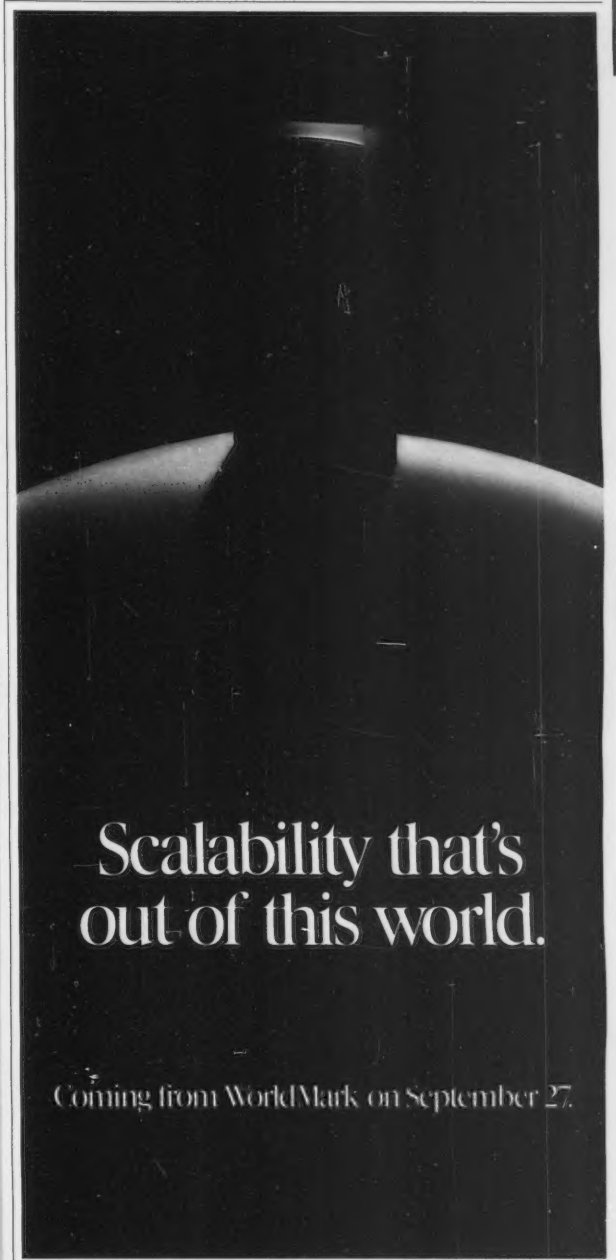
Business model

IBM is also planning to link Flowmark with the Business Modeling Tool (BMT), its workflow design software.

BMT lets users easily define their processes, and it evaluates the process to highlight areas for improvement. The software also looks at the impact of changes on both the company and its customers.

"BMT would potentially be a tremendous differentiator," said Scott McCready, an analyst at International Data Corp. This is because few workflow products are directly integrated with a business process re-engineering tool, he said. McCready added that the user interface still needs work, though.

With BMT, users could translate their models directly into Flowmark's application language, saving time in building a workflow process. — *Tim Ouellette*



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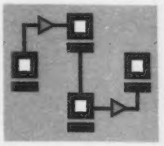
Show highlights growth of product data management

By Tim Ouellette

It's a different kind of vision thing.

At first glance, the EDMS/PDM Vision '95 show in Chicago this week would seem to be a dance in alphabet soup.

But the engineering document management systems (EDMS) and product data management (PDM) software previewed at the show are designed to organize such confusion for large manufacturers and engineering firms.



The software acts as the main interface for users who need access to all kinds of information related to a product's development stages — including computer-aided design drawings, part diagrams and lists — along with the applications used to create the documents. But this doesn't mean it is for engineers only.

"For us, its greatest use is for the customers of engineering," said Ron Cozad, senior principal systems engineer at Toro Co. in Bloomington, Minn., a user of Computervision Corp.'s PDM software. "Other departments, like purchasing, didn't know which revision they should be looking at."

Now engineering doesn't have to print out design files for other users. Instead, these users access the files from a central vault and view and mark up the diagrams as they please, Cozad said.

The PDM market is experiencing about 30% growth per year, according to CIMdata, Inc. in Ann Arbor, Mich., largely because it helps with both document management and product engineering data.

At the show, IBM is slated to announce Product Manager Version 3, which includes a revamped graphical user interface (GUI), added graphical workflow features and simplified user customization.

Data sampler

Following are some of the product and engineering document management software packages being announced this week at the EDMS/PDM Vision '95 show in Chicago

Vendor	Product	Feature
Computervision	Optegra data manager	Transparent on-line access to enterprise data, regardless of the data's location
Novasoft	NovaManage 6.2 document manager	Graphical workflow builder; management of distributed documents
Fujitsu	DynaServe 2 storage management	One interface for all storage management
IBM	Product Manager	New graphical user interface and easier customization tools

> Customers of engineering derive the greatest benefit from engineering document management systems and product data management software.
>
> — Ron Cozad, systems engineer, Toro Co.

Tools, software on the way

One company is turning to the Internet for PDM support. Control Data Systems, Inc. in Arden Hills, Minn., will preview its InfoEngine software, a search tool that uses Netscape Communications Corp.'s Navigator as its GUI. The browser displays information across any platform as Hypertext Markup Language.

Another major player in the PDM market, Sherpa Corp. in Pleasanton, Calif., is expected to make an announcement related to its Sherpa PDM software.

As is the case with the merging of document management and product data management, PDM vendors are also beginning to add workflow features to their products.

"Our next piece of the project is workflow as a way to enforce our procedures," Cozad said. "Some of the things Computervision is putting into the base level of the workflow module are giving users the opportunity to do project management as well."

According to Ed Miller, president of CIMdata, workflow was a natural addition for PDM software. "The integration of document management and product data is controlled by life cycle processes or workflows," he said.

E-mail security

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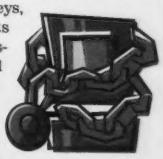
vulnerability. To resolve this issue, the industry has developed the encryption algorithms, Data Encryption Standard and RSA public key encryption — neither of which is in widespread use.

No denying it

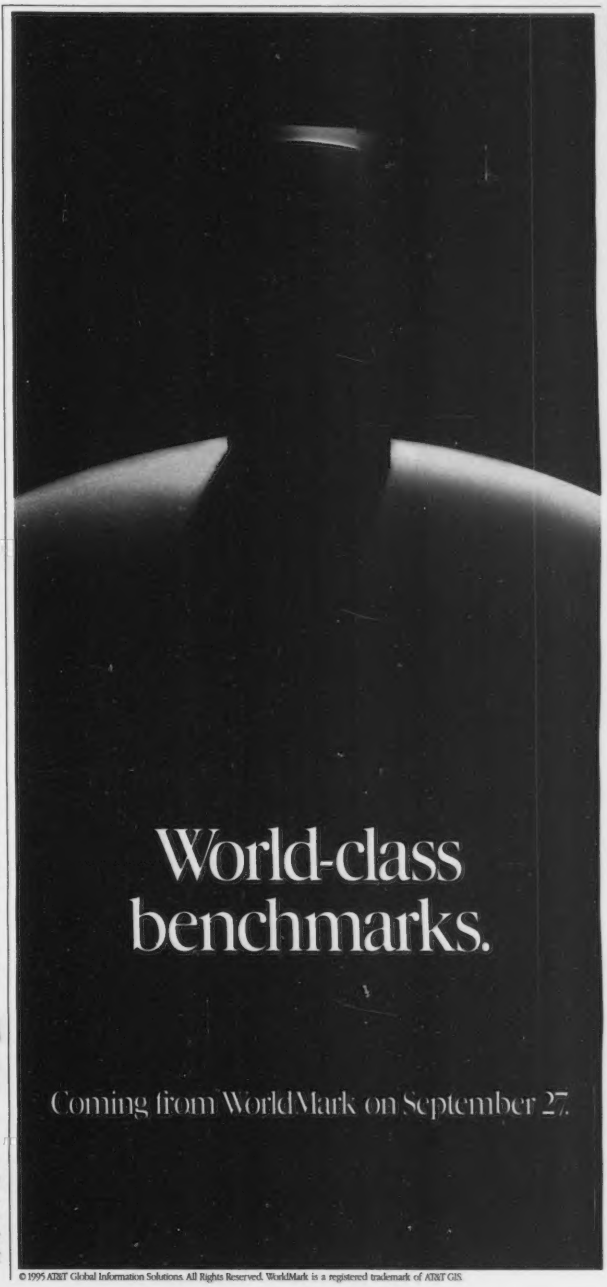
A time stamp is an important E-mail security need, according to Charles Cresson Wood, an analyst at Information Integrity Investments. Issued by an impartial third party, a time stamp would be similar to a postmark and with it the sender couldn't deny having sent a message.

Directory security is an issue holding E-mail back, according to Rik Drummond, president of Drummond Group, a consultancy in Fort Worth, Texas.

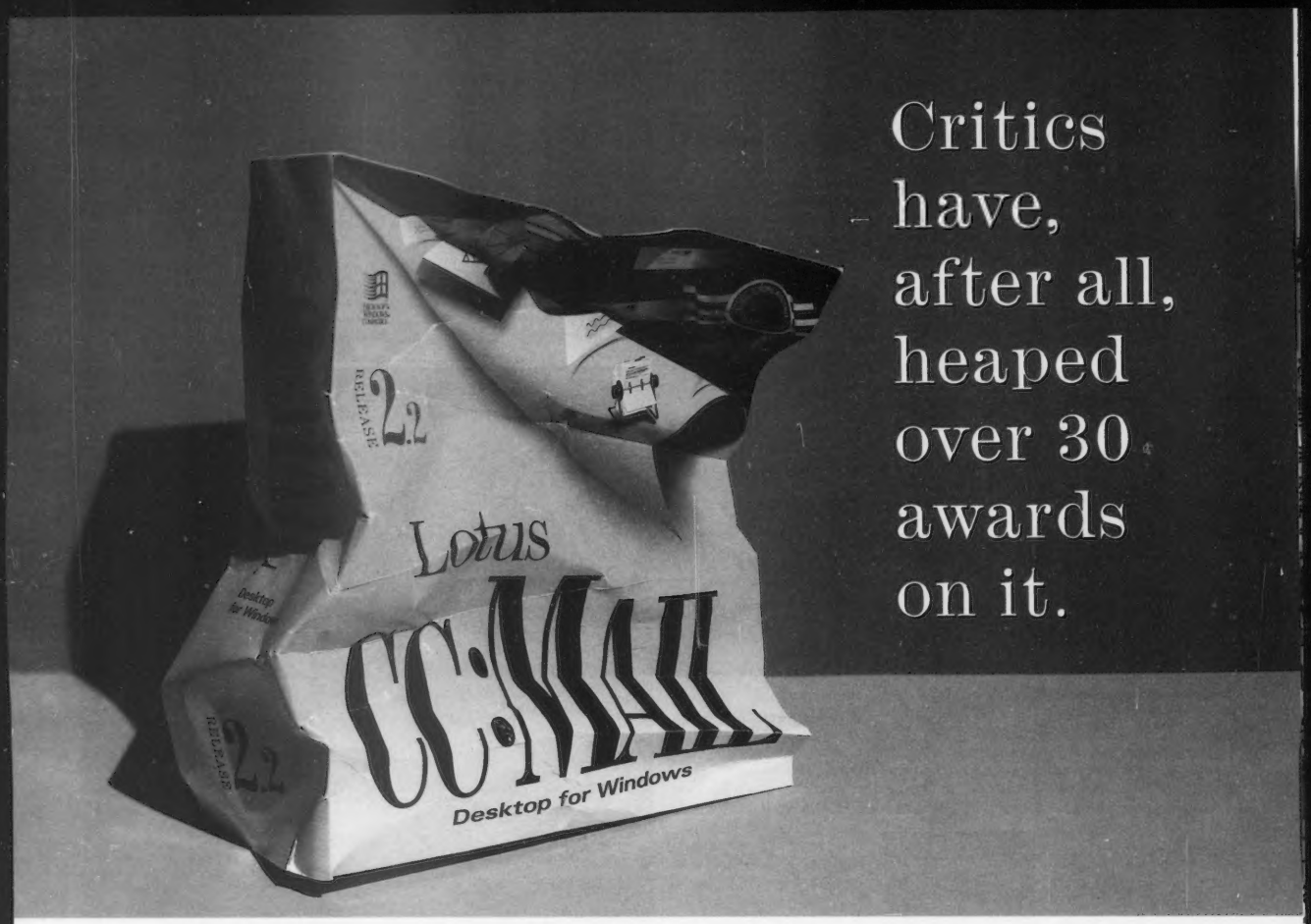
X.509 is the security standard for directories, and X.500 allows directories to handle public keys, which let recipients unscramble messages created with a private key.



However, no central authority now distributes public keys or maintains a directory of those keys. Banks or the U.S. Postal Service may step in to provide this service on a large scale. Until then, businesses that don't use encryption should keep in mind that using a public E-mail system is akin to sending an important message on a postcard.



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Critics have, after all, heaped over 30 awards on it.

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cc:Mail



Just some of the awards bestowed upon cc:Mail:

- PC World's Best e-mail Software, February 1995.
- LAN Magazine's Product of the Year in the e-mail Category, March 1995.
- Network Computing's Well Connected Award for the Best e-mail, April 1995.
- LAN Times, Reader's Choice Award, Best e-mail Product, May 1995.

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New Products

SoftArc, Inc. has rolled out FirstClass Server for Windows NT, a 32-bit communications server.

According to the Markham, Ontario, company, FirstClass Server for Windows NT is compatible with other installed FirstClass clients and servers. It was designed to encourage communication and collaboration across diverse employee workgroups by including features for group conferencing, forms processing, electronic mail, database access, on-line service functions and remote access.

FirstClass Server for Windows NT supports more than 100,000 user accounts per server and allows simultaneous connections of more than 250 users through network or remote connections.

Pricing for FirstClass Server for Windows NT starts at $495 and includes five user licenses. Other platform licenses, protocol options and gateways are sold separately.

▶ *SoftArc*
(905) 415-7000

GNP Computers, Inc. has unveiled GNP WorkServer, a communications server designed for telecommunications and commercial markets.

According to the Monrovia, Calif., company, GNP WorkServer is based on Sun Microsystems, Inc.'s SPARC engine and can use a Sun SPARC 5, 10, 20 or UltraSPARC motherboard as its CPU. Applications are available for Internet access, voice-activated speed-dialing systems, wireless communications, advanced intelligent networks, billing authentication and digital signal processing.

GNP WorkServer's alarm and diagnostic system will send an alarm to any location to alert operators about a software or hardware problem. Individual modules of the system can be turned off and on remotely, or the server can perform a remote shutdown of a malfunctioning module.

Pricing for GNP WorkServer starts at $35,000.

▶ *GNP Computers*
(818) 305-8484

Time Line Solutions Corp. has introduced Time Line 6.5, a Windows-based project management system.

According to the Novato, Calif., company, Time Line 6.5 is based on an Open Database Connectivity-compliant SQL relational database. It lets users integrate project data with business applications stored in other databases and can be customized to fit the requirements of individual workgroups.

Time Line 6.5 features an on-line, continuous help system that provides instructions for building project plans. It also has customizable menus, tool bars and keyboard commands. Time Line 6.5's database architecture lets users manage multiple projects simultaneously through cross-project links that create automatic data sharing. It has macros that let users automate repetitive tasks, and it lets users create dynamic links with other applications. Schedules can be imported or exported from Microsoft Corp.'s Project.

Time Line 6.5 runs on Microsoft's Windows 3.1 or later, Windows NT or Windows 95. The product costs $699.

▶ *Time Line Solutions*
(415) 898-1919

Argent Software, Inc. has unveiled Quota Server 1.4 for Windows NT.

According to the Torrington, Conn., company, Quota Server 1.4 allows a site to set and monitor disk quotas on Microsoft Corp.'s Windows NT. It lets a site set a quota for each object on a disk and define actions that execute when certain threshold levels are exceeded. It also gives users the ability to monitor other disk-consuming applications, including document storage systems, fax and electronic mail.

Quota Server 1.4's actions are defined in three threshold levels set up as a percentage of the disk quota. It can notify the end user or the administrator, lock objects and write to the event log for each level attained. It is event-based and called to check an object as soon as the operating system discovers a change in the file system.

Pricing for Quota Server 1.4 for Windows NT starts at $1,800.

▶ *Argent Software*
(203) 489-5553

Primavera Systems, Inc. has unveiled SureTrak Manager 1.5 for Windows.

According to the Bala-Cnwyd, Pa., company, SureTrak Manager 1.5 is low-end project management software that helps users manage resources throughout a project's life cycle. It has organizational and multiproject capabilities. Project wizards guide users through the process of managing multiple projects. It offers connectivity to other applications through full Open Database Connectivity. It supports OLE and is compatible with Microsoft Corp.'s Office.

SureTrak Manager 1.5 has a Project Groups feature that allows groups to share a common pool of resources, perform cross-project resource leveling and standardize on corporate methods for organizing projects. It also includes industry-specific templates that provide a blueprint for implementing the project coding process and activity logs with performance information.

SureTrak Manager 1.5 for Windows can connect users in remote locations. Users of Lotus Development Corp.'s CC:Mail or Microsoft Mail use it to broadcast schedule information to individuals and then collect updated information.

SureTrak Manager 1.5 for Windows costs $299.

▶ *Primavera Systems*
(215) 667-8600

Robichaux and Associates has released Professional Hotnet for Windows, a customer support product.

According to the Houston company, Professional Hotnet for Windows lets help desk users log and track customer calls and search prior calls for problems and resolutions. Users can assign priorities and track types of calls through customer, equipment inventory and support databases.

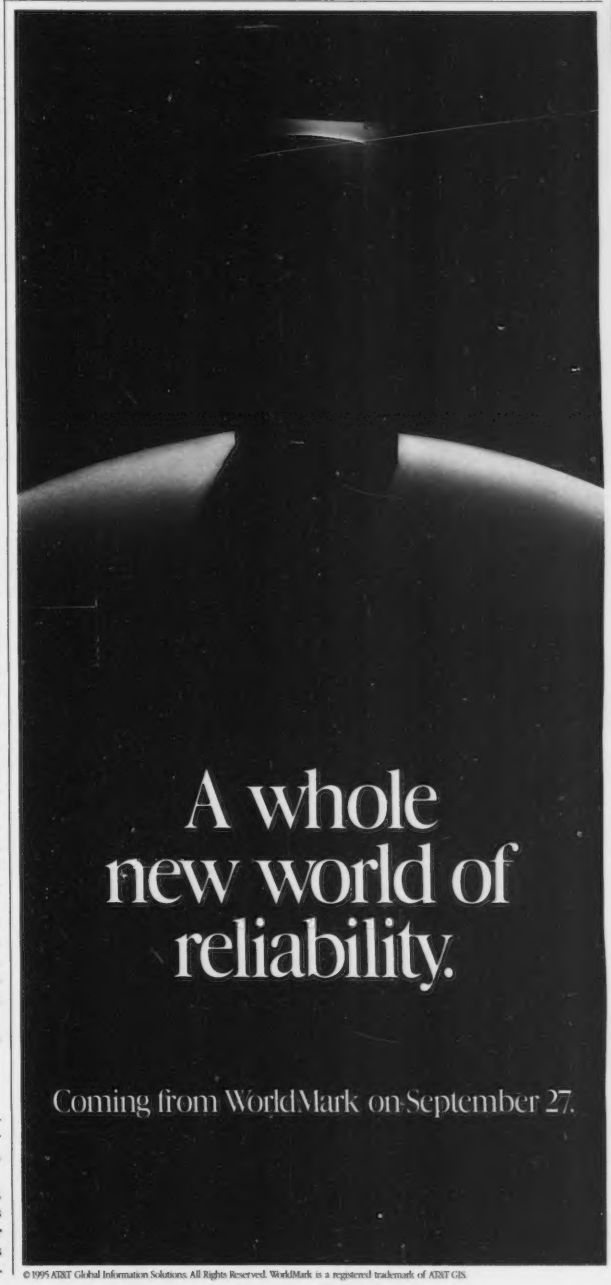
The product includes reporting functions, a workgroup database of error codes and solutions and network information. It runs on Microsoft Corp.'s Windows 3.1.

Professional Hotnet for Windows costs $399.

▶ *Robichaux and Associates*
(713) 579-1983

Product short

Socket Communications, Inc.'s Socket Wireless Messaging Service now includes international access, voice mail and call connect. The service can operate as an Internet electronic-mail gateway, has features for operator dispatch and a modem access line for computer-based messaging. Cost: $399, plus monthly service charges. Socket Communications, Fremont, Calif. (510) 744-2700.



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Fast Ethernet trudges along

Expanded, 100M bit/sec. bandwidth good for servers, overkill for desktop

By Bob Wallace

Fast Ethernet technology is at a crossroads and seems to be headed nowhere fast as a desktop technology.

Developed in 1992, Fast Ethernet offers users 10 times the bandwidth of traditional 10M bit/sec. Ethernet for less than twice the cost. However, vendors are having a tough time pushing the high-speed networking technology to the desktop.

Less than 10% of corporate desktops are using applications that require even 3M bit/sec. of bandwidth, according to CIMI Corp., a research firm in Voorhees, N.J.

Another research firm, the Dell'Oro Group in Menlo Park, Calif., said only 28,400 Fast Ethernet ports shipped in the first half of 1995, while 569,000 switched Ethernet ports shipped.

So where exactly does Fast Ethernet to the desktop stand? A growing consensus labels the technology "overkill."

"An overwhelming number of users don't need 100M bit/sec. to the desktop, nor will they anytime soon," said Tom Nolle, president of CIMI.

"We don't have applications that would need that much bandwidth," said John Lee, director of electronic commerce at Falcon Microsystems, Inc. in Landover, Md. "We've heard quite a bit about switched Ethernet and Asynchronous Transfer Mode at 25M bit/sec., both of which could be better for handling client/server computing needs and future applications like videoconferencing."



Fast Ethernet

Fast Ethernet may make sense as a backbone option in client/server scenarios where multiple clients seek access to a limited number of high-speed servers or a backbone network. It can also help PCs handle demanding data applications.

Using Fast Ethernet as a backbone makes sense to Ted Kull, a project manager for systems engineering at Educational Testing Service in Princeton, N.J. "We see Ethernet switching as the high-speed technology to the desktop, with [Fast] Ethernet for backbone purposes," Kull said.

Meanwhile, with many users looking hard at switched Ethernet and Asynchronous Transfer Mode, Fast Ethernet backers have scrambled to turn up the volume (see chart).

Ironically, those moves come as the Fast Ethernet Alliance, an 80-member industry association designed to promote knowledge and use of Fast Ethernet wares, last week claimed that it had achieved its goals and would disband.

Analysts agreed that the alliance was no longer needed, but for different reasons.

"You don't need an alliance to push a commodity product," Nolle said. "And with adapter card prices falling so quickly, that's exactly what those products are."

But vendors still maintain there are applications for Fast Ethernet.

"There are graphics-intensive applications and things like imaging and multimedia that need the bandwidth," said Mike Lance, a product marketing manager at Networth. "Fast Ethernet gives them a lot of headroom."

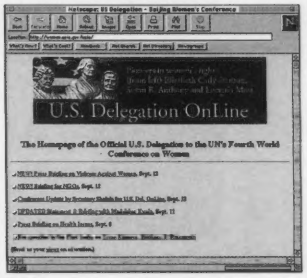
The last pitch

Vendors have done the following to boost user interest in Fast Ethernet

Vendor	Sales tactic
3Com	Offers users who agree to buy 30 100M bit/sec. Ethernet adapter cards a free Fast Ethernet switch
	Will ship a Fast Ethernet router interface that enables users to link 100M bit/sec. Ethernet islands
	Instead of costing twice as much as regular 10M bit/sec. adapters, Fast Ethernet adapters cost only one-third more
Networth	Gives out free evaluation units and has been touring the country holding 100M bit/sec. Ethernet education seminars for users
	The first major player to announce Fast Ethernet products that use Category 3 twisted-pair wire, the most widely used in building cabling
Grand Junction Networks	Announced a starter kit aimed at letting users try the technology at a low price

Users with high-speed networks may find new analysis tools useful. See page 84.

Being there



While Beijing was the locale for the United Nations' Fourth World Conference on Women, the World Wide Web hosted several sites tied to the nine-day meeting.

The U.S. Information Agency, Bureau of Information sponsored a site that provided regular updates on conference happenings. It contained links to continuously refreshed information, including speeches, briefings and event summaries.

Hillary Rodham Clinton's address appeared immediately after she spoke Sept. 5. Also included was a daily installment of diary-style writings from U.S. Secretary of Health and Human Services Donna Shalala.

See **The Internet Page** for more 'net news Page 76

Law firm thrives on bleeding edge

Use of technology gives legal eagles an edge in courtroom, negotiations

By Neal Weinberg
BOSTON

Beneath the Brooks Brothers suits and button-down shirts at law firm Hale and Dorr beat the hearts of techno-tigers.

No puny PCs for these legal eagles: Hale and Dorr lawyers have Sun Microsystems, Inc. SPARC workstations armed with 32M bytes of RAM and 1G-byte hard disks on their desks. On the road, they pack Unix-based Tadpole Technologies, Inc. notebooks with 800M bytes of disk space.

"It's a phenomenal benefit," said lawyer Hal J. Leibowitz. "We take our entire system with us wherever we go. I actually have all my documents with me at all times."

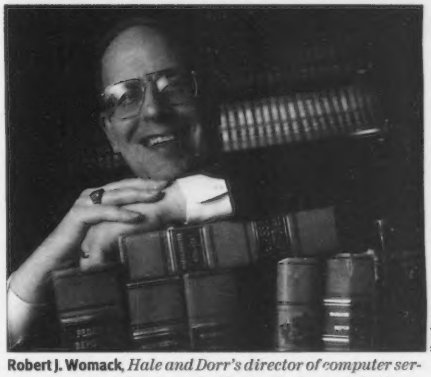
Leibowitz said he was negotiating a complex deal for a client over the course of a weekend. The final pieces didn't fall into place until Sunday, and he needed to file documents with the Securities and Exchange Commission on Monday.

From his remote location, Leibowitz prepared the documents he needed without ever logging back into the host system. And when he did, an automatic file exchange program read all changes made on the notebook computer and updated the file server.

Into everything

Hale and Dorr does it all: Home page on the Internet, Asynchronous Transfer Mode to send massive files between the firm and its clients and an Integrated Services Digital Network to the war room that helps the firm prepare for major litigation outside Boston.

But Hale and Dorr doesn't buy technology for technology's sake, according to its information systems director.



MARK ALCARAZ

Robert J. Womack, *Hale and Dorr's director of computer services, says training is 'probably the single most challenging thing we do'*

"We deliver legal services," said Robert J. Womack, director of computer services. "We use technology to deliver value to clients."

For example, Hale and Dorr uses a variety of devices to help speed up trials and give its attorneys an edge. Those include a special presenter that displays documents on

Law firm, *page 80*



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and support stance.



Its plug and
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hardworking, upgrade look.

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pentium PROCESSOR

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Its "bring on Windows 95" pose.



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THE INTERNET PAGE

Hyperlinks vex webmasters

Site connectors spawn legal and economic concerns for developers

By Kim S. Nash

The Internet and World Wide Web have forced some information systems groups to tackle a whole new set of potential business and technical gotchas, not the least of which is the art of hyperlinking.

Hyperlinks are the colored words and eye-catching icons on Web pages that are programmed to transport Web users from one on-line site or page to another. IS professionals who build, manage and maintain Web sites can connect their companies' pages to those of another. But virtually anyone else also can latch on to your site.

> **"When you go to a party and say you sell hot links, people either think you're a hooker or you work in a barbecue joint."**
>
> **— Shelley Morrison, advertising manager, Starwave Corp. on-line division, Seattle**

IS people, therefore, must determine how much control they want over the content associated with the company's site.

"The Web is a frenzied set of experiments," James Gosling recently told an audience of Web developers in Chicago. Gosling is the creator of Sun Microsystems, Inc.'s Java Web programming language.

Some shops are taking a cautious approach to hyperlinking in particular.

For example, Nissan Motor Corp. USA in Carson, Calif., has opted to keep tight reins on the content and, therefore, links associated with its Web site, according to Robyn Sweet, IS manager at Nissan.

Watch where you're going

Legal issues are a main reason why Nissan avoids linking to the sites of individual Nissan car owners — however loyal those customers may be — because "we're not responsible for their content," Sweet said.

There are no laws that spell out whether hyperlinks to another site are implicit endorsements of that site's content, Sweet explained.

Another important point, according to one independent Internet consultant, is to make sure your home page doesn't send people off to other companies' sites.

He told the story of a computer maker that, in an early version of its home page, displayed links to the Web locale of the 1996 Summer Olympics. Those signposts, which directed users right off the page, were the first thing users saw.

The company "gave the user no choice but to leave the page and go clicking around to the Olympic home page," the consultant explained.

Other companies have been given word from on high to make the corporate Web site an information resource for users. Steamboat Ski Co., for example, wants its home page to be an all-out guide to skiing.

"Constantly searching around to make sure that the links are current and in working order is a bear," said Betsy Brunton, manager of electronic media for Steamboat in Steamboat Springs, Colo. "But that's what we've chosen to do for our users."

Global Web use prompts need for multilingual pages

By Tim Ouellette

■ Languages that have nothing to do with Hypertext Markup Language, C++, Cobol or Smalltalk are becoming an important concern for developers of World Wide Web pages.

That's because as much as 14% of the 14 million users who access the World Wide Web don't live in North America.

"Especially for multinational companies, it makes sense to have Web pages in several languages," said Laurent Chemla, a Web page manager at a global resort firm. He said problems include translating the page into various languages and the amount of space numerous pages use.

Tools to climb this on-line Tower of Babel are becoming available. America Online, Inc.'s Internet venture, Vienna, Va.-based Navisoft, Inc., recently inked a deal to provide users of its Web software and services with multilingual search capabilities.

With software from the Xsoft division of Xerox Corp. in Palo Alto, Calif., users developing Web pages with Navisoft products will have access to linguistic databases in English, French and German. The company is considering licensing other languages, especially Asian languages.

Linda Dozier, vice president and chief technologist at Navisoft, said the company's software, with the help of the XSoft natural language technology, will let businesses creating Web pages search the Internet for related links in multiple languages.

And a service from Rancho Park Publishing in Los Angeles converts Web pages to any major language while retaining the page's original formatting and look.

Automatic choice

One problem still to be tackled with multilingual pages is that the user must choose from a number of languages when he comes to the page.

One user in Mexico suggested that browsers such as Netscape Communications Corp.'s Netscape incorporate a language option that automatically searches for the user's preferred language and chooses the correct Web file when he faces such a choice. "The behavior of the page loading would then be the same as Netscape has right now," said David Martinez, a software engineer at a private university.



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After outlining the benefits of seeing and being seen in cyberspace, illustrate just how your IS group will help the company wring financial benefits from participating in the Web – and how the IS department can cut costs at the same time.

If at least three solid arguments don't spring to mind to justify the claims, consider attending some conferences.

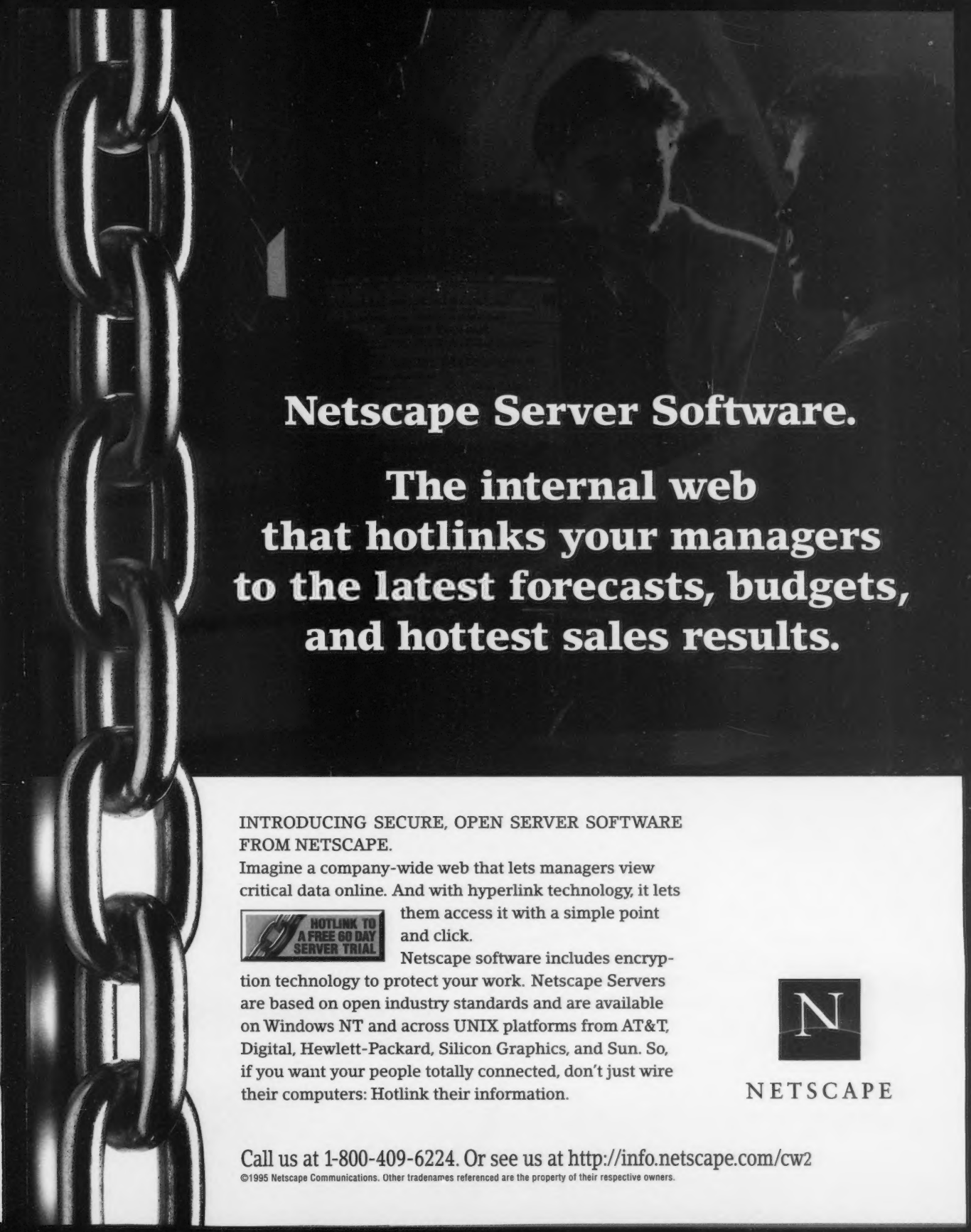
■ **Fall Internet World** in Boston, sponsored by Mecklermedia Corp., is expected to draw several dozen software, hardware and service companies that offer Internet products. The show is slated for Oct. 30 to Nov. 2. Try to stay focused if you attend.
See **http://www.mecklerweb.com/.**

■ A month later, Nov. 28-30, DCI, Inc. plans to put on a similar show, dubbed **"E-Mail World/WebWorld/Internet World"** in Boston. Presentations will be given mainly by vendors. Look for more information at **http://www.ocm.com/dci/internet/default.htm.**

■ On Oct. 7-8, the nonprofit group Computer Professionals for Social Responsibility is sponsoring a conference called **"The Good, the Bad and the Internet"** in Chicago. Scheduled are seminars on the future of a democratic Internet and on what's next in a cyberhungry IS job market. Check out **http://www.cs.uchicago.edu/discussions/cpsr/annual/index.html** for more details.

■ To bone up how to mesh business goals with Internet technology, surf over to **http://wwwsbanet.uca.edu/conferences.html.** That site houses information on "Integrating the Internet in Today's Business," a show to be held in Little Rock, Ark., Oct. 27-28. Greg Simon, chief domestic policy adviser to Vice President Al Gore, is slated to speak at the show.

■ Finally, early December's **"Fourth International World Wide Web Conference"** will be hosted by The W3 Consortium of vendors, research groups and users in Boston. At **http://www.w3.org/hypertext/Conferences/WWW4/,** you can find details about the show's scheduled seminars.



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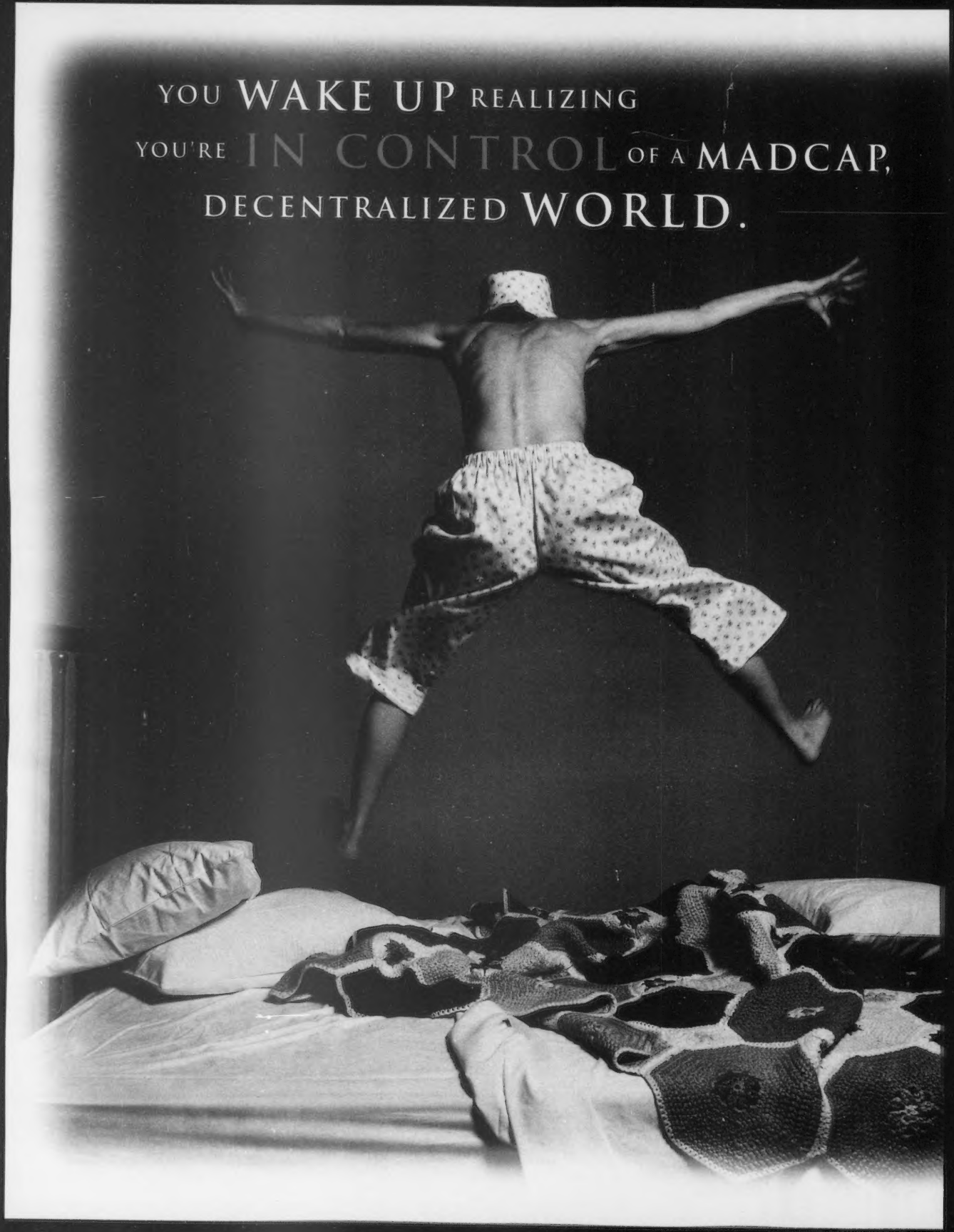
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IS-bred tools target net management

By Patrick Dryden

Frustrated by a lack of tools to handle specific management tasks on multivendor networks, some information systems departments have built their own and are taking them to market.

Last week, NetSuite Development Ltd. in Wayland, Mass., launched network design software originally developed to simplify the planning and deployment of networks at Boston-based brokerage Fidelity Investments. NetSuite is backed by Fidelity's venture investment arm.

A product-specification library links to this network-specific drawing software, which generates files documenting connections for both central designers and installers in the field.

And TennEcon Services, a division of Tenneco Gas Co. in Houston, recently introduced security administration software created to ease the supervision of user accounts throughout the corporate network.

From one Windows PC console, an operator can manage user accounts for diverse servers and databases. Support for mainframe security systems and Notes is in the works, officials said last week.

Good example

Analysts said that users struggling with client/server projects can benefit from the efforts of these IS departments.

"Such organizations spend the most effort administering LANs because that's where all the fires spring up," said Jennifer Pigg, director of data communications research at The Yankee Group, a Boston consultancy.

"Fidelity learned that better design and implementation reduces those fires," Pigg said. "The tool they created chips away at the resource constraints most IS groups labor under now, making for a more sane environment."

The NetSuite product line builds on NetSuite Professional Design, network-oriented layout software similar to computer-aided engineering tools, and an object database called NetSuite Library.

Instead of manipulating clip-art icons with a drawing package and referring to separate equipment lists, users see the number of free slots and know the module options for a vendor's hub, for example. The software validates connections, notes required components and documents the new or updated network configuration in a file.

"We need to map what we've actually purchased and configured, but we had to do this with a drawing tool and a spreadsheet," said beta tester Bill Kupiec, operations manager at the Baltimore molecular biology research center of the Carnegie Institute.

The integrated functions streamlined network documentation and saved the expense and training time required with enterprise network management databases or high-end network design systems, according to Kupiec.

A Fidelity senior technical analyst said the company needed the tool to improve "communication between the design and implementation teams and provided accountability for what's out there in our 18,000-user network. It helped everyone keep up with the current state of the network."

At Tenneco Gas, the problem was user administration. IS had to support new client/server systems without hiring new staff.

A team developed a Windows-based program called Net Workshop that interacts with diverse systems via encrypted communication. It supports Unix, Microsoft Corp. Windows NT and Novell, Inc. NetWare servers as well as databases from Oracle Corp. and Sybase, Inc.

"Net Workshop gave us immediate relief managing 3,000 NetWare users on 90 servers, and we're evaluating it for our Unix users," said Wes McClean, manager of security planning at Toronto-based Consumers Gas Co., a natural gas distributor.

Users with high-speed networks may find new analysis tools useful. See page 84.

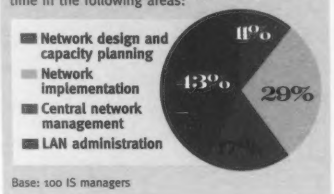
Do it yourself

These two companies came up with their own tools for network management

Company/Product	Description	Platform supported	Price/Availability
NetSuite Development **NetSuite Professional Design** (funded by Fidelity Investments)	Object-oriented network design/documentation software helps lay out and check connections. It's backed by a library of 2,000+ vendor specifications for internetworking and WAN products.	486-based or higher PC running any version of Windows	$495 through December; $995 starting Jan. 1, 1996; $295 per year for library update/October
TennEcon Services (division of Tenneco Gas) **Net Workshop**	Security administration software for managing users on multiple network and database servers	386-based or higher PC running Windows 3.1	$700 per NetWare server, $1,000 per Unix server/Now

Time-consuming tasks

Networked organizations spend management time in the following areas:



Base: 100 IS managers

Source: The Yankee Group, Boston

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Law firm thrives on bleeding edge

CONTINUED FROM PAGE 73

large television screens for the judge and jury to see, a laser-disc presenter that shows animation and Macintosh-generated graphics.

Matlock vs. Reality

While television lawyers such as Ben Matlock use detective work and brilliant cross-examination to win cases, the most demanding aspect of real litigation is simple document management. Hale and Dorr uses imaging technology so lawyers sitting in court can retrieve information via laptop.

Having the niftiest graphics and access to key documents quicker than the opposition doesn't win cases alone, but it helps the firm deliver "a persuasive effort," Womack says.

Technology pervades every aspect of the firm. Hale and Dorr is a beta-test site for Wildfire Communications, Inc.'s Wildfire voice recognition telephony system. The firm routinely uses videoconferencing. Each lawyer can access Lexis/Nexis from his or her desktop, and even scheduling conference rooms is handled on-line.

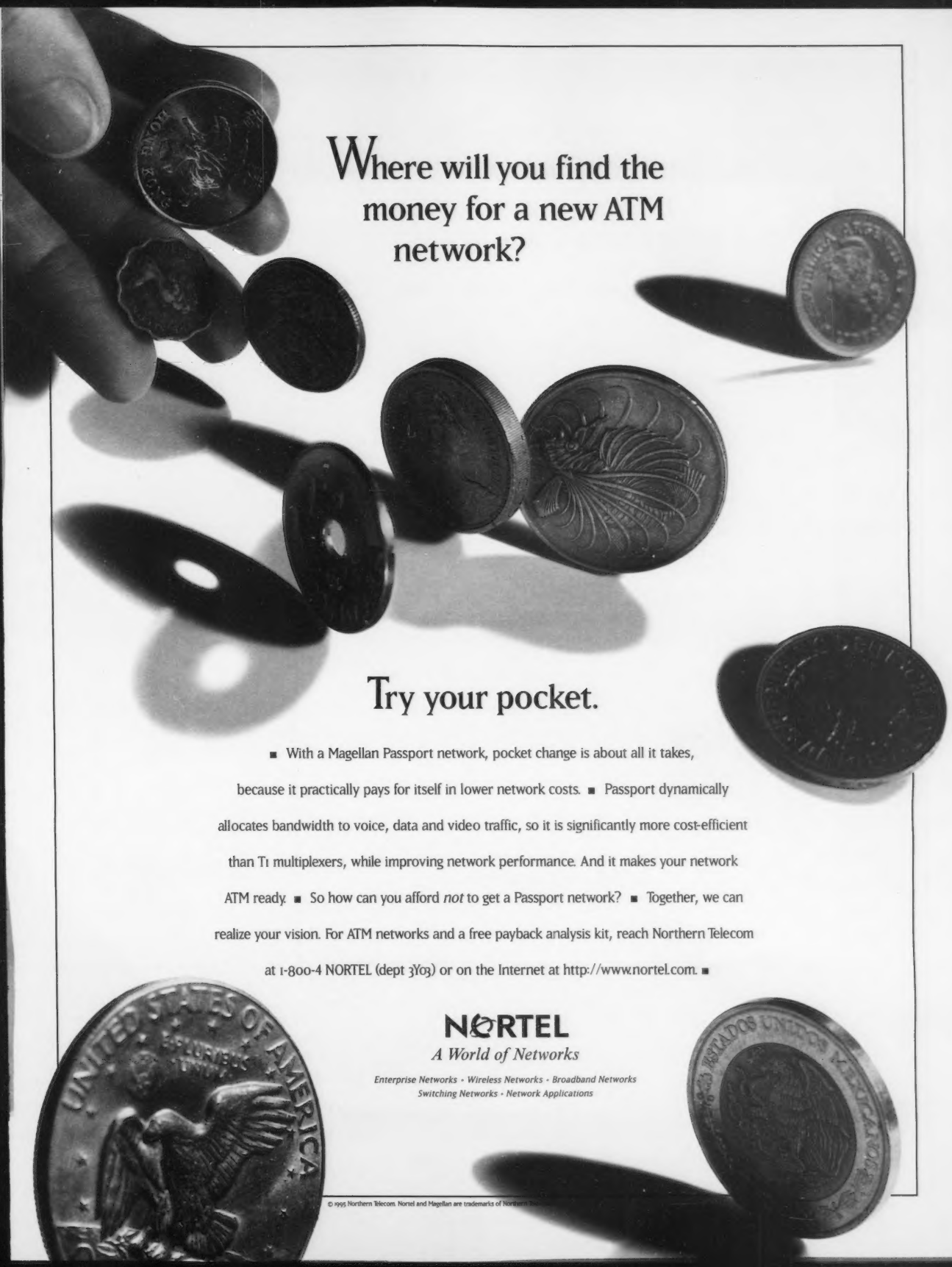
For Womack, the overriding issue is not how to stay ahead of the technology curve; it's training. "It's probably the single most challenging thing we do," he says.

Part of the challenge is making people aware of how the technology can help them do their jobs, and part is getting people to make time for the training.

Womack has learned to be creative. He schedules brown-bag lunches at which lawyers share their experiences. He put together a technology fair where attorneys could browse around and sample the offerings.

He takes special care to package the applications so they are easy to understand and implement. And there are certain "technical minimums," like using electronic mail, that are required of new hires. The price tag for skating on the bleeding edge is steep, but Mara Aspinwall, director of client services, said it makes no sense to try a cost/benefit analysis because there is no alternative.

"It's a necessity of doing business. We continue to invest to keep clients happy," she said.


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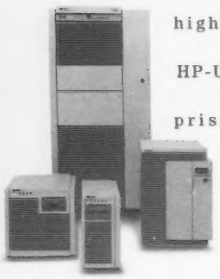
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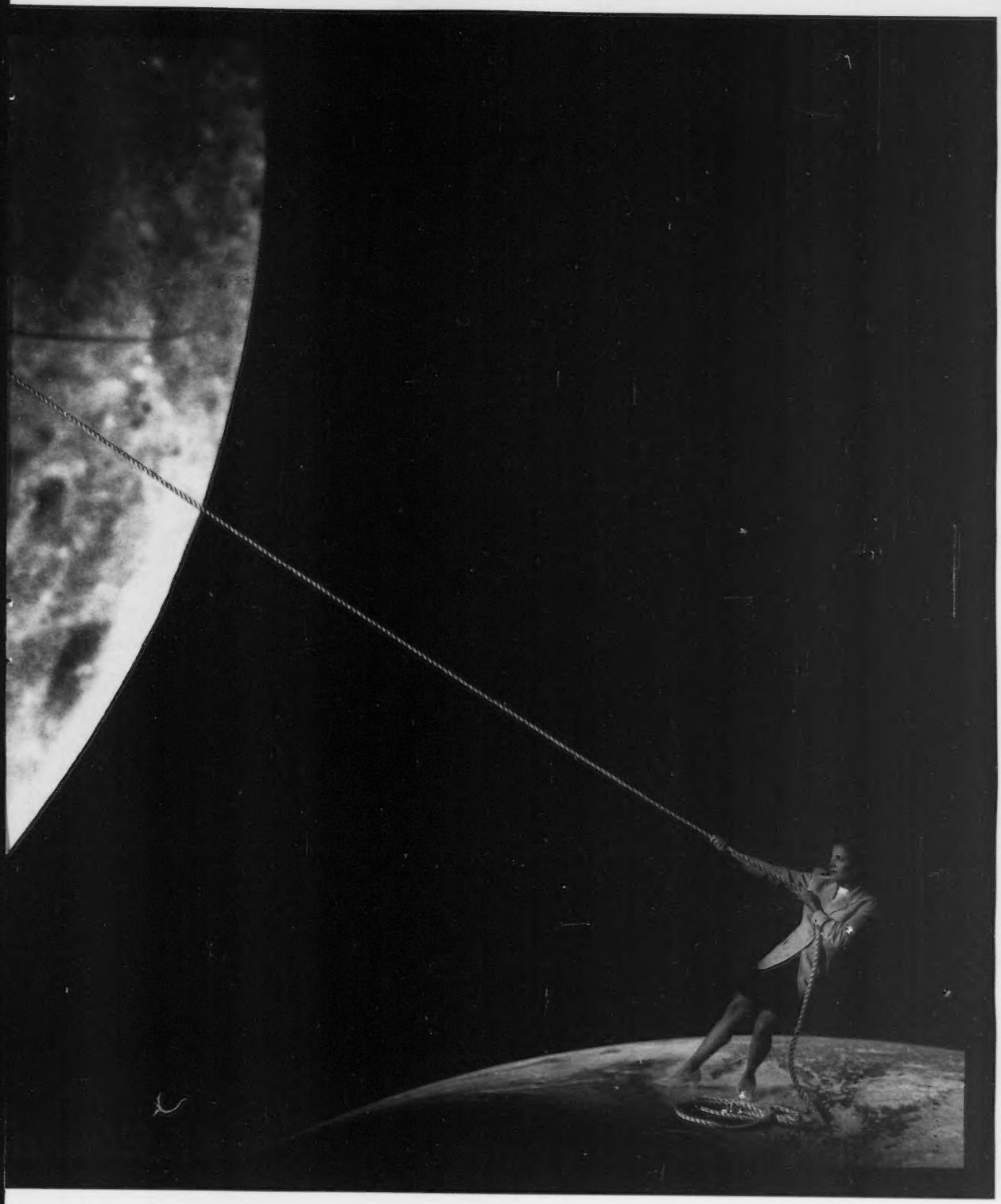
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Network General sniffing faster

Protocol analyzers test traffic over ATM, 100M bit/sec. network connections

By Patrick Dryden

Network General Corp. this week will demonstrate new versions of its Sniffer protocol analyzer for testing traffic over fast network connections at Networld/Interop '95 in Atlanta.

The availability of the first 100Base-T analyzer and a less expensive Asynchronous Transfer Mode (ATM) analyzer will help ease the deployment of these new technologies, according to industry observers. The troubleshooting tools support 100Base-T Ethernet segments operating at 100M bit/sec. and 155M bit/sec. ATM circuits.

Atlanta-based network integration and management consultant Information Management Systems, Inc. has an immediate need for the Fast Ethernet Sniffer Analyzer to help test LAN performance upgrades, said company President Roosevelt Giles.

"Many clients are linking servers to LAN switches at 100M bit/sec. and building some workgroups of workstations and Pentium PCs that quickly saturate a normal LAN with certain applications," Giles said. He bemoaned the lack of tools to troubleshoot new Fast Ethernet, or 100M bit/ sec., connections, which can suffer the same problems with collisions and framing as regular Ethernet.

Speedy management tools

Those planning high-speed networks may want to wait for Network General's upcoming protocol analyzers to help with monitoring and troubleshooting new connections

PRODUCT	PRICE/AVAILABILITY
Fast Ethernet Sniffer	$15,000 (adapter and software)/November
ATM Sniffer Analyzer	$27,000 to $39,500 (adapter and software)/ December
Portable PC platform	$10,000 (100-MHz Pentium PC with 32M bytes RAM and 1G-byte disk)/Now

To help installers check old and new segments as networks migrate, the Fast Ethernet Sniffer Analyzer automatically adapts to 10M or 100M bit/sec. traffic over unshielded twisted-pair cabling. Both it and the ATM Sniffer Analyzer fit Network General's portable PC platform, so test crews can check many topologies.

Both products also preserve the same interface as previous Sniffer analyzers. This will ease the transition when users are confronted with strange new LANs, said Chip Mesec, a product manager at Network General in Menlo Park, Calif.

Narrow target

The analyzers, which begin beta tests this month, target production networks, although few exist.

"Demand for ATM tools is growing from actual implementers at more than 2,000 corporations, but these are macho technologists," said Jennifer Pigg, director of data communications research at Yankee Group, Inc. in Boston. "They must pay through the nose for tools created for switch developers."

The ATM Sniffer is priced at about one-third the cost of current analyzers, Pigg said. It supports circuit discovery as well as capture and decode functions for these operators.

Because it expects a mass market for high-speed networks to develop next year, Network General plans a major revision of its Expert Sniffer in the second quarter of 1996, Mesec said. That interface guides less technical users through network analysis and suggests causes and solutions to common problems.

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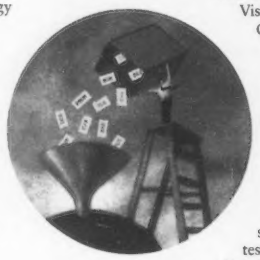
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The Client/Server Superbowl

Wednesday, October 4, 7:00-8:30pm

Key client/server development tools vendors Microsoft, Powersoft, Borland, Gupta, IBM, Symantec, and Oracle are set to put their Visual 4GL tools to the test. Specifications, designed by Christine Comaford, *PC Week*, will be handed out at the event. Watch on giant screens as the teams use the power of their tools to get through the specs in 1 hour.

Free Roundtables!

Tuesday October 3, 11:00am-12:00pm
Realities of Legacy Migration and Distributed Computing

Tuesday, October 3, 1:00-2:00pm
Application Plug-In Models

Thursday, October 5, 1:00-3:00pm
Comparing Component Software Strategies

Friday, October 6, 11:15am-12:45pm
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Imagine trying to predict the impact of PC application software in 1975. It would have been nearly impossible to foresee the full power of word processing and spreadsheet programs that are now so ingrained in contemporary work culture.

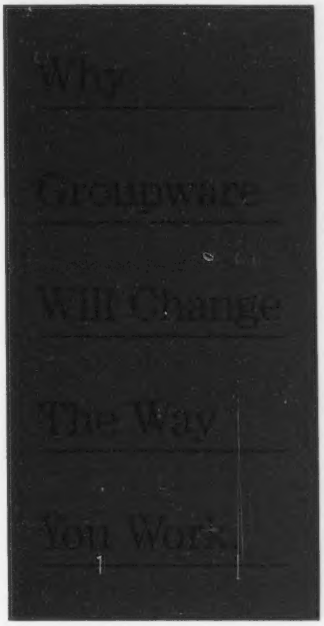
Twenty years later, we are on the threshold of another revolution in computing technology. It's called "Groupware."

Until recently, computer technology has mainly served to automate transaction-based, back-office applications or to improve personal productivity. Tools to manage the rich variety of document-oriented information — which is the lifeblood of most business processes — simply didn't exist. The limitations of technology stifled teamwork rather than encouraging it. Groupware resolves these dilemmas.

So, what is groupware? Groupware is software that uniquely enables organizations to communicate, to collaborate, and to coordinate key business processes. Groupware encompasses electronic mail, but goes far beyond messaging to act as an integrated platform for the development and deployment of a new class of client/server applications — applications that structure the flow of both structured and unstructured information in business relationships — among teams, across an enterprise, and between companies.

Groupware is so compelling because it allows businesses to create an organizational memory and share knowledge and expertise across time zones, geographies, and networks. It draws together the collective intelligence found in unstructured information sources like word processing documents, electronic mail messages, and faxes. Companies using groupware find that the barriers to high-performance teamwork that have plagued them fall away. According to International Data Corporation, groupware signals the second wave in desktop computing.[1]

At the same time, this emerging software category has become a source of confusion.



Technology buyers sometimes mistake a component of groupware for the whole. Corporations are making enormous investments in messaging technology, unaware of the additional benefits of an integrated messaging and groupware infrastructure.

Groupware must combine three essential elements to be viable:

A reliable, scalable and secure distributed document database. The database-centric model gives users the ability to assemble, share, and manage the rich variety of documents vital to conducting business — business plans, contracts, orders, product information, calendars and to-do lists, multimedia presentations, faxes, scanned images and video clips.

An integrated messaging system. Groupware users must be able to take advantage of a messaging infrastructure to send and receive electronic mail and move documents through a workflow process.

A rich application development environment. Developers must be able to rapidly build portable and scalable strategic applications which span document-oriented and structured database information.

Applications designed with these components can deliver mission-critical, enterprise-wide results like slashing product development cycles, enhancing relationships with customers, and automating a sales organization for greater productivity.

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In the coming months, we will use this forum to explore the issues around groupware. Our goal is to ensure that you make successful investments in this important product category.

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1. Lotus Notes: Agent of Change, International Data Corporation, 1994. 2. Ibid.

Speaker phone enters E-mail zone

By Suruchi Mohan

Oracle Corp. and Philips Home Services, Inc. will soon begin testing a service designed to let users exchange electronic mail over a screen phone.

Philips' screen phone now provides caller identification, banking services and directory services. Oracle's Oracle Office groupware offering includes E-mail and calendaring/scheduling.

The agreement between the two companies calls for Oracle to develop a special version of the E-mail component of its software to work with the screen phone. The product will be tested in the fourth quarter.

Citibank NA in Burlington, Mass., is one of several sites that will offer the integrated screen phone and mail services to its customers.

Citibank said it will make the service available to customers in the first quarter of 1996.

The value to customers, beyond banking over the phone, is that they will be able to send and receive mail messages.

In addition to a screen, the phone has a pullout keyboard. Customers won't have to maintain any hardware or software, apart from the screen phone; all the servers will be maintained by the company offering the service — Citibank, for example.

Users will, however, be able to add a PCMCIA card to the screen phone for storage, said Steve d'Alencon, director of product marketing at Oracle in Redwood Shores, Calif.

"This is a small entry into the world of electronic commerce," which includes on-line shopping and home banking, said Kevin Curtis, an analyst at The Yankee Group in Boston. Companies can work their way into this market in several ways, and this is a step in that direction, he said.



Philips' speaker phone *with Oracle's E-mail service has attracted the attention of companies such as Citibank*

However, the E-mail component from Oracle "won't be the missing link that drives screen phone sales through the roof," cautioned Tom Maresca, an analyst at Jupiter Communications LLC in New York. Nobody, he said, would buy a screen phone because of its ability to send and receive mail. However, "people are more comfortable with phones than with PCs," he said.

Right now, the screen phone is priced at $399, but Maresca said he expects the price to fall. Oracle will let users receive E-mail messages and mailboxes for free, but it has not yet determined the fee for outbound messages.

Move into parallel computing *without* reinventing any wheels

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Brief

Change analyzer out soon

Optimal Networks Corp. in Mountain View, Calif., recently unveiled the Optimal Networks Tool Kit, a suite of Windows-based applications for LAN and WAN modeling, topology discovery and analysis. The products in the kit, Optimal Surveyor and Optimal Performance, allow users to create "what-if" scenarios to evaluate the likely impact of proposed network hardware or software changes.

Optimal Surveyor will be available next month for $5,000, and Optimal Performance 2.0 will be available in the fourth quarter for $25,000.

The Value of an Integrated Messaging and Groupware Architecture.

The dramatic growth in the volume and content of electronic mail is becoming a major problem for network administrators around the world. The number of e-mail users has exploded, and what arrives in e-mail boxes can boggle the mind. Mailboxes and message stores designed as temporary holding places have become de facto repositories for an indiscriminate mix of junk mail and important corporate knowledge. This problem has intensified as messaging systems have evolved.

First generation electronic mail systems in the late 1970s enabled the transmission of simple, unadorned text messages. By 1985, a second generation of e-mail systems allowed users to attach documents to their messages. In 1990, e-mail's appeal broadened again when users could include rich formatted text, embedded graphics and tables in their messages. Soon there was no limit to what people could send — and message sizes grew accordingly.

The first three generations of messaging systems have relied upon a store-and-forward mechanism where mail is 'pushed' to the recipient's inbox. The push model places a burden on users and administrators to read, sort and dispose of an increasingly unwieldy volume of information — some of it critically important to the business, much of it irrelevant or outdated.

Now, a new generation of messaging system has arrived. This 'fourth' generation of e-mail is revolutionary because it combines the 'push' model of earlier systems with a 'pull' component based on a secure, distributed object store for managing messages and related documents.

For example, instead of attaching a spreadsheet to a mail message and 'pushing' a copy to every recipient, fourth generation messaging systems can provide links to information that reside in a shared database — even on the World Wide Web. The recipient can choose to 'pull' the information he or she wants to view. Rather than being overwhelmed with information, these links ensure everyone gets the most current information, if and when they need it.

This new fourth generation messaging architecture vastly reduces transmission and storage requirements and simplifies system management. In addition, a powerful technology called bidirectional replication permits automatic or scheduled synchronization of mail messages between the server and desktop or laptop computers. This facility means mobile employees can now work productively with or without connection to the network.

Groupware: The Natural Evolution of Messaging

A messaging system and a distributed object store are two of the three key components of groupware. By adding a powerful application development environment that is seamlessly integrated with these components, a simple communications infrastructure can be transformed and extended into a rich platform for building custom applications. These applications manage the communication, collaboration, and coordination of an organization's crucial business processes. In this sense, groupware is not a separate product category, but rather, messaging's natural evolution.

Only an integrated messaging and groupware infrastructure is capable of delivering the kinds of strategic business applications that enable measurable, long-term competitive advantage. By comparison, third generation systems with layered, cobbled-together integration become increasingly rickety as they try to scale or are forced into new application areas. An integrated messaging and groupware infrastructure can maximize your organization's current investment in messaging systems, while positioning your company for the new breed of applications that manage strategic business processes.

Only Lotus offers an integrated messaging and groupware architecture. It's called Lotus® Notes.®

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For more information, call **1-800-828-7086, ext. B158,** *or explore Lotus on the World Wide Web at www.lotus.com.* *©1995 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, Lotus Notes and Working Together are registered trademarks of Lotus Development Corporation.*

Security Dynamics preps security software for servers

By Bob Wallace

Remote access powerhouse Security Dynamics, Inc. has announced a release of its security software that analysts say is the most flexible security package for remote access hubs at central sites.

Besides controlling remote LAN access to users with special passcards displaying ever-changing code words, ACE/Server Version 2.0 now supports sites with tens of thousands of remote workers and multiple administrators.

The upgraded software replaces the system's menu-based interface with an Open Software Foundation Motif-based graphical user interface (GUI). It adds support for many simultaneous administrators and comes bundled with a relational database management system.

Before Version 2.0, "the system used a menu-based interface that was difficult to use," said Eric Ogren, a product line manager at Security Dynamics. "Users will find the new GUI much easier to use."

Bruce Rowland, operations manager at Bell Canada in London, Ontario, said the product's top new feature is its ability to support multiple administrators. This task is critical, he said, "since we now have over 2,000 remote users [on the system] and expect to have 25,000 by the end of next year. We need five administrators [at times] to input all the new users and cards and reset passwords."

Driving the need for powerful remote access security servers is an information systems trend toward supporting remote sites and the growing legions of mobile workers, but not letting unauthorized users access LAN-based resources.

Microsoft Corp., Novell, Inc., IBM and Shiva Corp. top the list of networking vendors that have integrated Security Dynamics' passcard/passcode technology in their remote access server products.

Analysts who closely track remote access lauded Version 2.0.

"The ACE/Server is definitely the product to beat for central-site, remote access scenarios," said John Morency, a principal at The Registry, Inc., a Stratham, N.H., consulting and research firm.

Security Dynamics' Version 2.0 also provides a standard SQL interface to the ACE/Server's security database.

"We wrote a program that automates certain aspects of inputting information into the database, that simplifies management of the system," Rowland said. "When your system is supporting thousands of remote users, you want to automate as much [database] administration as possible."

In addition, the product provides an RDBMS from Progress Software, Inc. in Bedford, Mass. It will also support Sun Microsystems, Inc.'s Sun OS and Solaris, IBM's AIX and Hewlett-Packard Co.'s HP-UX.

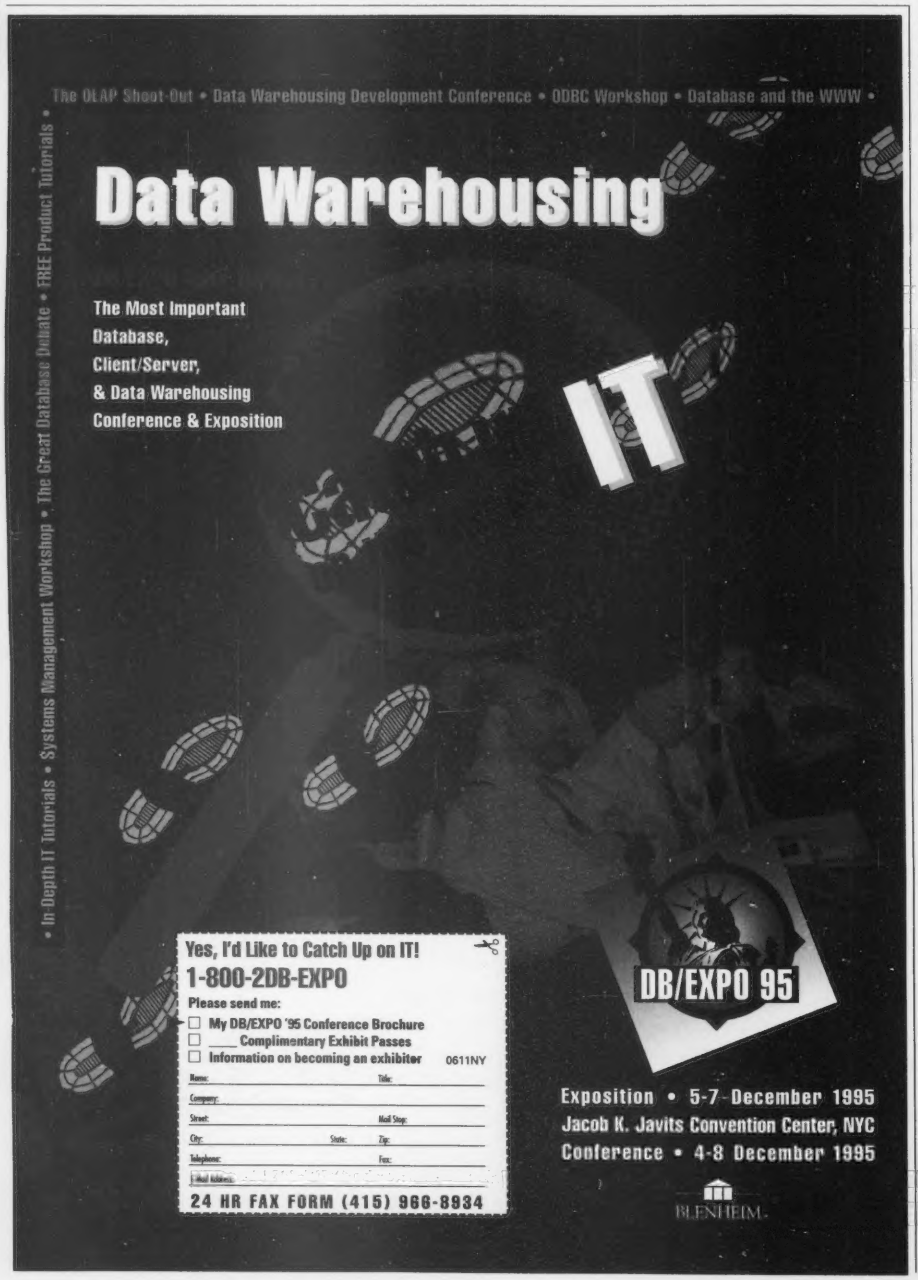
Version 2.0 starts at $2,450, with free upgrades for users under warranty and paid maintenance agreements. It will be available by year's end.

BEYOND LOCKS AND KEYS

A user is prompted for the password, which is displayed on the SecurID Password Card, a credit-card-like device. The displayed password changes every minute.



The password is checked against ACE/Server's database, which also changes every minute, to determine if the caller is an authorized user.



You wouldn't know it from the slick ads in trade magazines, but it's no secret to corporate developers that most traditional application development tools are difficult to learn, hard to use and ill-suited for many tasks. That's true whether you're developing, deploying or maintaining business applications.

Before development even begins, mastering a tool's design methodology and programming language can present a steep learning curve for application programmers familiar with third generation languages such as COBOL, but unfamiliar with the new breed of visual client/server development tools. This training is both expensive and time-consuming.

Once developers master the various GUIs, databases, languages and protocols needed to create a new application, they must integrate and deploy these components across their client/server infrastructures. MIS departments also must ensure that the application runs on all operating system platforms in the enterprise, that it can be easily moved across platforms, and that all users have the most up-to-date version. Deployment can often be as challenging as development.

Modifying or enhancing a business application requires additional code that must be integrated with the existing application. These incremental enhancements must be maintained for the life of the application. This is a complex process that typically results in maintenance costs exceeding initial development costs.

What organizations need is a client/server application development environment that will:

- Facilitate the rapid creation of strategic business applications
- Enable the automatic distribution and maintenance of applications
- Operate across all leading client/server platforms and networks
- Support remote and mobile users by allowing them to work while disconnected
- Provide robust security
- Interoperate with the leading client/server development tools.

The Power of a Groupware Application Development Environment.

Which brings us to Lotus® Notes.® We believe Notes offers an unsurpassed environment for rapid application development and deployment (RADD) that balances computing power with ease of use. With Notes, you can quickly develop business process applications that are optimized for managing a rich variety of document-oriented or semi-structured information, but can also incorporate structured database information.

Once you deploy an application, Notes' powerful replication technology *automatically* distributes updates to its design. Secure, reliable and automated application distribution solves one of the most pressing problems facing IT organizations today. New and improved business solutions begin generating results instantly.

All of these benefits are made possible by Notes' architecture, which seamlessly integrates a document database, a messaging system and a rapid application development environment. As a platform for integrated messaging and groupware applications, Notes represents the next generation in client/server technology and is an open environment that supports leading APIs and major industry standards.

Once people experience the ease and incredible speed of application development within Notes, they quickly become converts. Notes so accelerates the pace at which users can model, deploy and validate applications, that line of business professionals now work side-by-side with MIS staff to develop and prototype applications at many Notes sites.

By putting the power of Notes behind their application development efforts, thousands of companies are realizing staggering returns on their IT investments and building a new class of communication-centric applications that create lasting competitive advantage.

Only one application development platform lets you rapidly build portable, maintainable and secure enterprise-wide messaging and groupware applications. Lotus Notes.

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Farallon touts 'net router pack

By Amy Malloy

Farallon Computing, Inc.'s Netopia is neither first to the Internet router market nor is it necessarily the best product. But it may have a twist that will make it successful — one-stop shopping.

The Netopia router will include all or part of the following options:

- **Up & Running Guaranteed, which provides configuration of the router, connection to an Internet Services Provider (ISP), Integrated Services Digital Network (ISDN) provision and technical support.**
- **Bundled Software Kit, which includes programs such as Netscape Communication Corp.'s Navigator and Eudora Lite.**
- **Ethernet LAN Connection, for PCs or mixed environments, and TCP/IP routing.**

Analysts and users praised Netopia for its combination of simplicity and reasonable pricing.

"There are a number of products out there that have done similar things, but none for this price point and none" with this level of integration, said David Strom, president of David Strom, Inc., a consultancy in Port Washington, N.Y.

Alan B. Lefkof, Farallon's president and chief executive officer, said the company hopes to make a name for itself in the departmental router market by offering a better packaged effort than major internetworking players such as Cisco Systems, Inc.

Lefkof acknowledged, however, that Farallon's pitch is aimed at companies with decentralized decision-making.

New routes

The following are new routers available in November from Farallon:

Model number	630, 640 Windows	440 Macintosh and Windows*
Number of users	Up to five simultaneously (630); unlimited (640)	Unlimited
LAN connection	Ethernet (10Base-T), attachment unit interface	Ethernet, LocalTalk
Routing protocols	TCP/IP	TCP/IP, AppleTalk, AURP
Price	$1,299 (630); $1,599 (640)	$1,699

*Mixed environments

"If it all gets deployed from the large account, centralized office on down, we have a rough time ahead of us," he said.

Farallon will sell straight hardware, but users may also purchase Up & Running Guaranteed, a support program. With this program, Farallon will order the ISDN line, connect to an ISP and configure the router.

"You can spend the $500 [the support program] would cost you pretty quickly in time, if you don't get it up and running," said Mark Williams, president of Entrepreneurial Technologies, Inc. in Houston, a Farallon beta tester.

All in one

Farallon bundles Internet routers and software in one package, which includes everything needed to get the system working. A built-in NT-1, a device used to hook up several systems, eliminates the need for an external ISDN device, and Farallon provides Dynamic Host Configuration Protocol (DHCP), which automatically configures the host.

"As an Internet service provider, DHCP was one of the most interesting things I saw in the product," said Robert Berger, chief technology officer at InterNex Information Services, Inc. in Santa Clara, Calif. Farallon will offer Model 440 for its mixed environments customers and Models 630 and 640 for users in PC environments of varying sizes (see chart).

Lefkof said Farallon will put little marketing effort behind the 440, though, and will instead rely on its well-established relationship with Macintosh customers.

"If we're too successful with the 440, people will think we're just a Mac company," he said.

"Typically, when we had an important event coming up, we would rely on a mailing to our own database as the prime vehicle for getting the information to the people we had targeted.

This time, with our Enterprise Application Development & Executive Strategy Conference, we knew we had to have a marketing approach that would jumpstart awareness for the conference and educate the audience on Hewlett-Packard's Enterprise Application Development Program. We really felt we needed to create *our own* publication. A piece tailored to deliver information of real value to the customer. That, if they're building a business-critical application, the best platforms for their development are the HP 9000 Workstations and Servers.

Another important consideration was using a publication with a very broad-based appeal in the information systems arena. That's Computerworld. We know, because we asked our customers.

As a result, here we are months later, and we're still using several thousand reprints of the custom publication as a sales tool for the field, in a customer-deliverable format.

It worked very effectively in creating awareness of the conference and building preference for Hewlett-Packard programs."

Roberta Anslow
Program Manager
Hewlett-Packard
Enterprise Application Development

"My goals were to create awareness and build a preference for Hewlett-Packard in application development. The custom publication we created certainly did that for us."



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For more information, contact Carolyn Novack, Publishing Services Director, Boston 1-800-343-6474

The Truth About Replication.

With so many vendors claiming to offer replication in their products, we believe it's time to clarify what replication really is and explain why it's a critical system component for users, administrators and application developers. True replication is the capability to bidirectionally and efficiently synchronize multiple instances of a database among distributed clients and servers across multiple computing platforms.

It's More Than Public Mailboxes

Conferencing or "threadware" products claim to support file replication, but merely create public discussion mailboxes. Users can send only text messages and file attachments, and security is extremely limited.

It's More Than File Synchronization

File synchronization tools allow you to move files between folders on your network server and your laptop. These tools work well for personal use, but provide a weak foundation for collaborative activities. They work only at the file level, cannot find renamed files, and ignore deletions made while disconnected from the network.

It's More Than Relational Database Propagation

One-way replication is a feature of many relational database systems. A sales division, for example, can send sales figures to field offices, but those field offices cannot return updates or corrections. Relational database technology simply cannot handle multiple data masters, and therefore cannot fully support collaborative work processes.

Business Processes Require True Replication

Collaboration and coordination of team activities, whether within a workgroup or across an enterprise, deal with constantly changing, semi-structured information such as sales proposals and product specifications — the kind of information frequently used and modified by multiple people in multiple locations. What's needed is a flexible, two-way and secure replication mechanism to facilitate these kinds of business activities.

The replication technology within Lotus® Notes® is well suited for today's business processes. It supports bidirectional changes to database information — between users and servers or between servers — and sends *only* the information that has changed.

Replication technology must respond to changing business conditions. With Notes' selective replication, you can replicate only *your* regional sales data, *your* purchase approvals, and so on. Notes transmits changes at the document level today, and will offer field-level replication in its next version, Release 4.0.

Notes offers unparalleled support for mobile users. You can work with a local database replica on an airplane, and replicate updates to co-workers (while their updates replicate to you) when you reach your destination.

Notes' replication offers flexible conflict resolution. In the unlikely event that two people work on the same document simultaneously, Notes keeps both versions and automatically flags the conflict in the database. You can manually or programmatically decide how to resolve the conflict. Other products simply notify the database manager.

Notes revolutionizes application maintenance and distribution. Notes replicates not only data, but application design elements as well. Developers are now free to improve applications without worrying how to distribute the changes — even to mobile workforces.

Finally, Notes replication is reliable and scalable. Notes servers establish scheduled replication sessions, so synchronicity is assured. Other message-based replication methods are error-prone due to unpredictable delivery rates.

Notes offers the most advanced, comprehensive replication available today. Combined with its distributed object store and its superior application development environment, Notes can support a new class of strategic business applications such as worldwide sales force automation, cross-functional project coordination, and links to customers and partners, regardless of their computing platform.

Today's new breed of collaborative business applications demands true replication. Only one product has it. Lotus Notes.

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Briefs

McAfee details Saber fate

McAfee Associates, Inc., in Santa Clara, Calif., recently detailed plans to combine its systems management products with those of **Saber Software Corp.** McAfee bought Saber earlier this year. The object-oriented McAfee Systems Management enterprise console, running on Microsoft Corp.'s Windows 95, will sit atop the Saber LAN Workstation systems management suite, into which a variety of McAfee and Saber systems management tools will be combined.

AT&T nets Red Cross contract

AT&T Corp. recently won a contract with the American Red Cross in Washington to build BioNet, a high-speed, national data network for connecting 44 regional blood banks.

On-line in Omaha

US West Communications, Inc. is giving 50,000 Omaha residents a chance to try multimedia services via interactive television. Called US West TeleChoice, the trial will let residents subscribe to a television programming series delivered via a video dial-tone network, including six pay-per-view movie channels and digital music services. Services to be added later in the trial include movies on demand, navigator screens and home shopping.

Savings for NetView users

Sterling Software, Inc. has introduced a new pricing program, NetGain Plus, that claims to save IBM NetView for MVS users 25% to 59% of their monthly licensing fees. Sterling also unveiled AutoGain, a sales and migration program designed to attract Legent Corp. customers.

SNA over frame relay

Netlink, Inc. in Framingham, Mass., is now shipping TurboFRAD, a frame-relay access device (FRAD) that enables users to run IBM SNA traffic over wide-area frame-relay networks. The device supports adaptive burst rate and multilevel bandwidth allocation. This helps ensure consistent response times and session integrity, which is needed to run SNA-based applications over frame-relay networks. A base-model TurboFRAD has one LAN interface (Ethernet or Token Ring) and four serial interfaces. Pricing starts at $2,200.

Hypercom algorithm sings

Hypercom, Inc. in Phoenix this week will demonstrate at Networld/Interop '95 in Atlanta the ability to transmit packets of voice over frame-relay links in its Integrated Enterprise Network family of hybrid routers. The feature uses a special module that supports a variable rate voice-compression algorithm. The algorithm provides toll-call quality voice between 800 bit/sec. and 8K bit/sec. voice compression rates. No pricing or availability for the modules was given.

Banyan boosts clients

Banyan Systems, Inc. recently broadened client support for its enterprise networks by adding software for Microsoft's Windows 95 and an update for Windows NT. Banyan's new 32-bit drivers operate faster than previous versions and use special Windows functions, including common log-in, Windows NT's SQL Server support and Windows 95's Network Neighborhood, My Computer and Explorer, according to the Westboro, Mass., company.

New switching hub arrives

Network Peripherals, Inc. in Milpitas, Calif., recently announced the EIFO+ Client/Server Switching Hub. The EIFO+, designed for departments with less than 500 users, supports 12 switched 10M bit/sec. ports and two Fiber Distributed Data Interface (FDDI) or Copper Distributed Data Interface (CDDI) uplinks to servers or backbone networks. Users can divide up to 1,014 Ethernet addresses in any manner across the 12 switched Ethernet ports. Expected to ship by month's end, the hub costs $8,495 with two CDDI uplinks and $9,595 with two FDDI uplinks.





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The Newspaper of IS

Then you can spend less time reading about the world of information systems. And more time conquering it.

Ask most Lotus® Notes® users, and they'll tell you the benefits speak for themselves: Custom business applications that slash cycle times, redefine operational efficiency and eliminate paper. Financial returns that International Data Corporation calls "simply staggering."† A rapid application development environment that is quickly becoming the client/server tool of choice.

Yet to a systems administrator, all this collaborative computing can imply huge challenges — not to mention the potential hassles in administering far-flung networks. Without a reliable and manageable infrastructure for messaging and groupware, and the tools to maintain it, no distributed computing architecture can live up to its business potential.

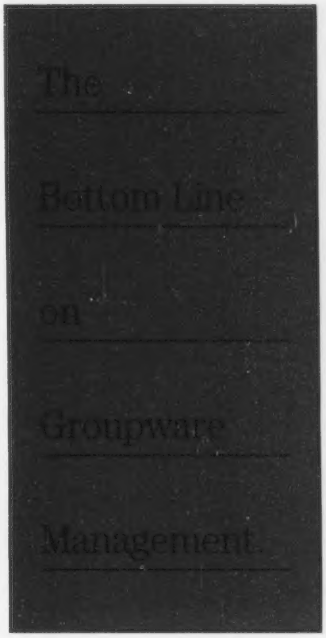
What IS teams need are practical ways to:

- Deliver reliable systems for users while minimizing costs
- Develop and deploy mission-critical applications across geographies and heterogeneous computing platforms
- Provide efficient and responsive end user support.

For all these reasons, Lotus Notes offers elegant solutions to the common challenges around managing groupware and messaging networks.

The Notes View on Network Management

Trying to manage a network without real-time information on traffic flows is like working with a blindfold. NotesView,™ Lotus' graphical management tool, literally gives administrators a picture of how a network is functioning — including statistics on mail delivery, replication, and database server performance. Alert mechanisms point out mail routing bottlenecks or disk space availability issues, allowing administrators to act *before* end user service levels are affected. Any server in the Notes environment can be accessed from a single administrative console, allowing you to centralize server support while retaining the flexibility to locate servers for optimal performance or minimal telecommunications costs.



NotesView also supports the industry-standard management protocol, SNMP, allowing you to leverage the expertise of your IS staff and a wide array of SNMP-based tools.

Application Development and Deployment

Notes comes with an integrated application development environment that allows you to rapidly develop robust workflow applications that can integrate with your legacy systems and even access external data sources like the World Wide Web. Notes' unique replication technology distributes applications and data across diverse computing platforms and geographies, and synchronizes Notes directories. As a result, administrators can manage application deployment from anywhere in the network.

Notes also lets you automate repetitive administrative actions, such as recertifying user IDs. Moreover, Notes lets you centralize administrative tasks such as setting up replication topologies for the enterprise, while tasks such as adding new users can be performed at the local level.

The Product Is the Solution

Custom help desk applications built with Notes technology are available from Lotus or many of the over 10,000 Notes business partners. Notes' built-in workflow capabilities can route service requests to the appropriate support specialist automatically, even paging them if necessary, and Notes lets you track these calls all the way through to resolution. Finally, Notes lets you store a complete history of each incident in a secure database, providing a rich knowledge warehouse for the future.

The bottom line for today's administrators is that the better you can manage your systems, the more valuable you become to your business units.

Managing groupware cost of ownership is only one way that Lotus is helping thousands of organizations attain competitive advantage. And they're doing it with one product. Lotus Notes.

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This is the fifth in a series of short essays on the benefits of groupware technology. To receive a bound set of all six essays, please call **1-800-828-7086 ext. B161.** *Or explore Lotus on the World Wide Web at* **www.lotus.com.** *©1995 Lotus Development Corporation, an IBM subsidiary, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, Lotus Notes and Working Together are registered trademarks and Notes View is a trademark of Lotus Development Corporation.* *†Lotus Notes: Agent of Change, International Data Corporation, 1994.*

New Products

Computone Corp. has introduced IntelliPort II Expandable PCI-EX, an expandable I/O-mapped multiport product for Peripheral Component Interconnect (PCI) bus microcomputers.

According to the Roswell, Ga., company, IntelliPort II Expandable PCI-EX is a multiport subsystem that combines modular expandability with data buffering and rates of up to 200K bit/sec.

Each multiport module is equipped with surge/spike protection on all transmit and receive signals. Tower modules include a wiring cabinet, a removable door and an LCD panel for the monitoring and control of individual ports.

Pricing for IntelliPort II Expandable PCI-EX starts at $795.

▶ *Computone*
(404) 475-2725



IntelliPort II Expandable PCI-EX *is a multiport subsystem for PCI bus computers*

Nashoba Networks, Inc. has introduced the Concord FDDI Uplink Option, a product that provides connectivity for Token Ring sites with campus-based Fiber Distributed Data Interface (FDDI) 100M bit/sec. backbone rings.

According to the Littleton, Mass., company, the product enhances manageability and security to Token Ring networks and interconnects Token Ring users to the enterprise FDDI backbone.

The Concord FDDI Uplink Option supports an 8,000-address forwarding/filtering table and can support source-routed packets over the FDDI link. It includes four switched-ring Token Ring ports and can be configured with an FDDI Uplink as a four- or 12-port Token Ring switch.

The Concord FDDI Uplink Option costs $12,500.

▶ *Nashoba Networks*
(508) 486-3200

Network Software Associates, Inc. has introduced NS/3270 for OS/2, a PC-to-mainframe communications software package for PCs running OS/2 .

According to the Irvine, Calif., company, NS/3270 for OS/2 provides users with an extended multiprotocol communications product for heterogeneous networking environments. NS/3270 for OS/2 emulates IBM 3278 terminals (Models 2 through 5) and 3287 printers. Features include two host sessions, file transfer, keyboard remapping, a graphical tool bar and automatic font sizing. It supports OS/2 2.1, 2.11 and OS/2 Warp.

NS/3270 for OS/2 costs $95.

▶ *Network Software Associates*
(714) 753-0800

SAS Institute, Inc. has announced the expansion of its InfoTap software to support all Microsoft Corp. Windows clients and filter more than 70 new sources.

According to the Cary, N.C., company, InfoTap offers users real-time searching and retrieval of on-line data from multiple sources. InfoTap software indexes news items and makes the indexes available in real time. It was designed for applications involving quick access to on-line competitive analysis and business intelligence.

InfoTap is available on all Windows and Unix platforms, including Hewlett-Packard Co.'s HP-UX, Sun Microsystems, Inc.'s Solaris and IBM's AIX.

InfoTap is licensed on an annual basis. First-year fees start at $10,000 for five clients.

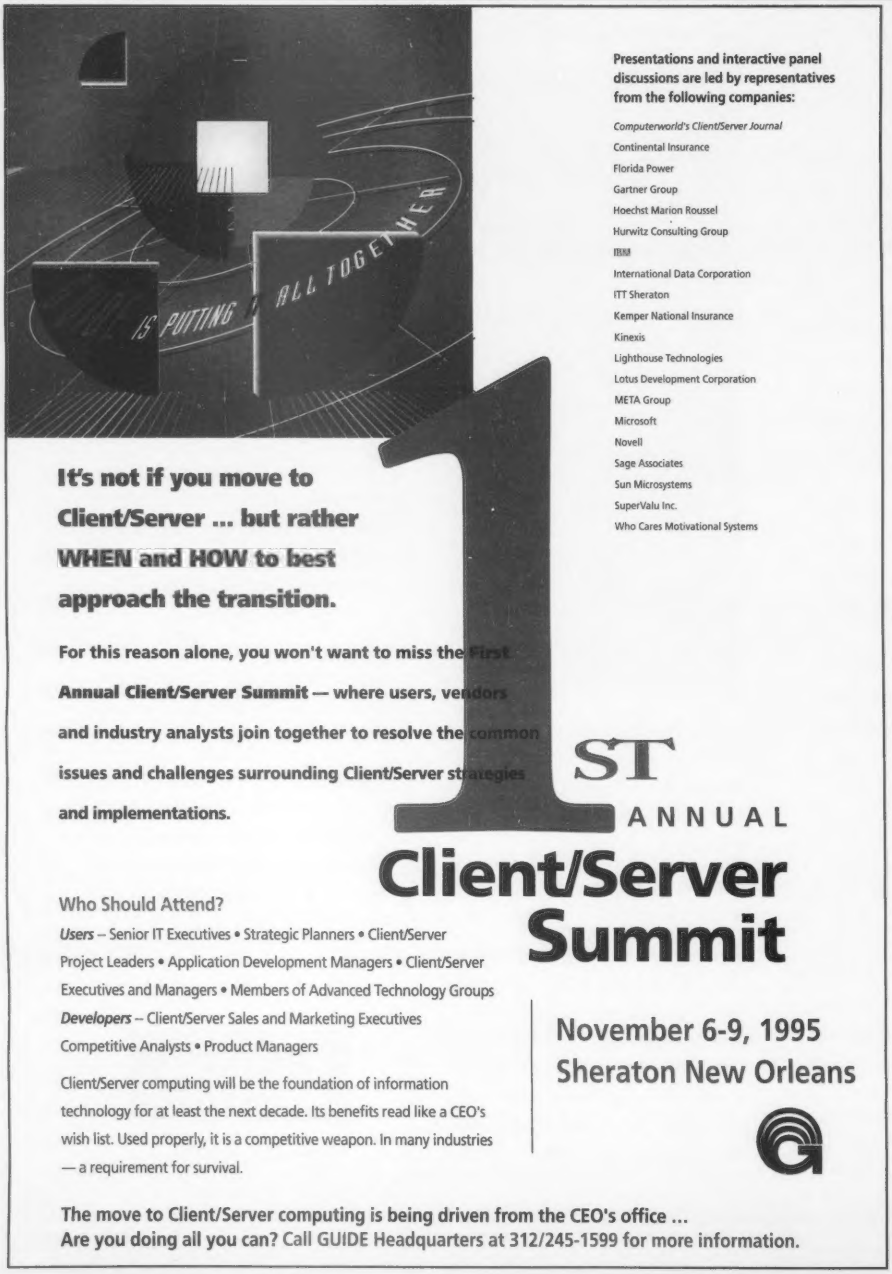
▶ *SAS Institute*
(919) 677-8000

Nortel, Inc. has introduced Entrust/Toolkit, security software products.

According to the Nashville company, Entrust/Toolkit can integrate security functionality into a variety of applications quickly through a high-level application programming interface. It includes encryption and digital signature functions and automated networkwide key management.

Pricing for Entrust/Toolkit starts at $5,000.

▶ *Nortel*
(615) 734-4000



The benefits of electronically extending your enterprise have never been more compelling: closer bonds with customers and suppliers, better project coordination, and new distribution channels for goods and services. But bringing down the walls between businesses also raises new challenges: ensuring secure electronic commerce, managing complex projects between companies, and supporting highly distributed teams. The question is, how can today's businesses build inter-enterprise applications that offer security, reliability, scalability, and seamless user support?

Until recently, e-mail, electronic data interchange (EDI) and public networks such as the Internet defined the scope of inter-enterprise connectivity. These tools work well for simple information exchange and structured transactions, but are not well-suited for collaborative business-to-business applications that move documents through a multi-step process. To broaden the possibilities of an extended enterprise, a company should consider several criteria in choosing its communications platform:

- Cross-platform support for heterogeneous operating environments
- Robust, multi-level security
- Open and flexible connectivity
- Rapid development and deployment capabilities for custom applications
- Tools for mobile user participation in work processes.

To meet these requirements, enter Lotus Notes,® the ideal tool for extending your business. Because any system connecting a business to its customers or suppliers must accommodate a wide variety of computing platforms and networks, Lotus Notes runs on all popular operating systems, including Windows® and Windows NT,™ OS/2 Warp® and AIX,® Macintosh,® Sun Solaris,® HP-UX,™ SCO OpenServer,® and as a NetWare® Loadable Module (NLM).

Equally important, Notes™ offers the most robust security available, including RSA encryption, user authentication, digital signatures, and multi-level access control. And users can access Notes networks by LAN, WAN, or telephone dial-up.



Notes also includes bidirectional replication to manage the complexity of application updates between companies. Notes replication distributes not only data, but the latest application design as well. With Notes, inter-enterprise applications that support team problem-solving and automated workflow become possible. Notes even offers a full range of choices to integrate your legacy and relational systems into these new collaborative applications. And Notes networks can scale to support up to 100,000 users with the appropriate server infrastructure.

Many companies have redefined their inter-enterprise business processes using Notes. Others have built entirely new businesses around it.

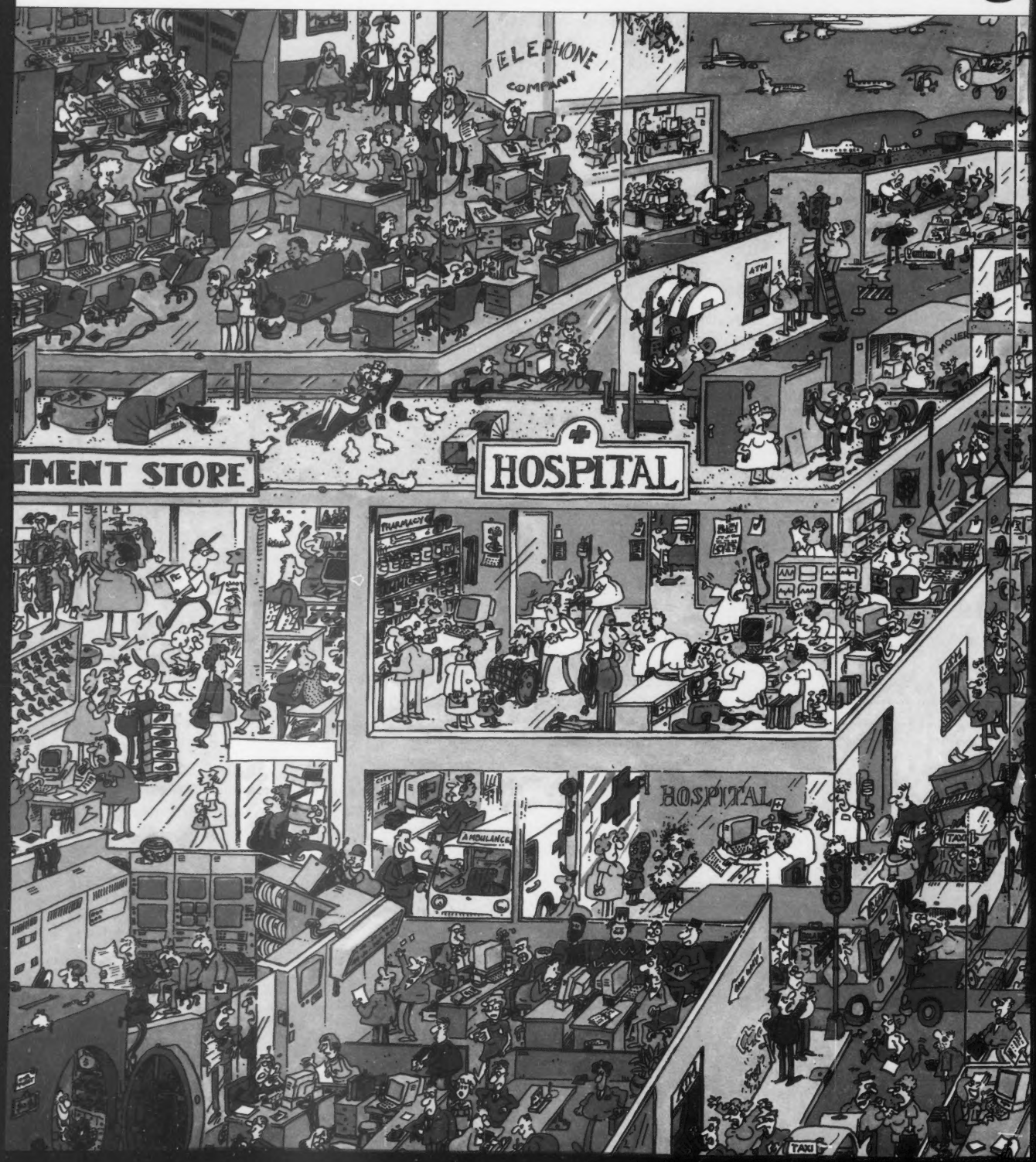
- A software company has built a Notes-based business partner network which *continuously* updates resellers with the latest product information, technical notes, and even customized pricing. The result: faster time to market for products, shorter sales cycles, and improved customer service.
- New network-based businesses are linking buyers and sellers in secure electronic commerce anywhere in the world. These new companies offer services from brokering the disposal of hazardous waste materials to helping insurance companies negotiate significant savings on legal bills through precise job tracking and prompt electronic payments.
- For highly distributed collaboration, many companies are outsourcing WAN communications and finding value in managed, private Notes network services. Through AT&T Network Notes,™ a joint venture between Lotus® and AT&T® to provide Notes-based services over the AT&T Worldwide Intelligent Network, AT&T provides application hosting, WAN and server management, customized billing, and administration and support services.

Ultimately, whether you choose to manage your WAN or outsource it, you must build an inter-enterprise communications environment on a firm foundation. **Only one groupware product lets you create applications for mission-critical business processes, whether your world headquarters are in a skyscraper or a spare room. Lotus Notes.**

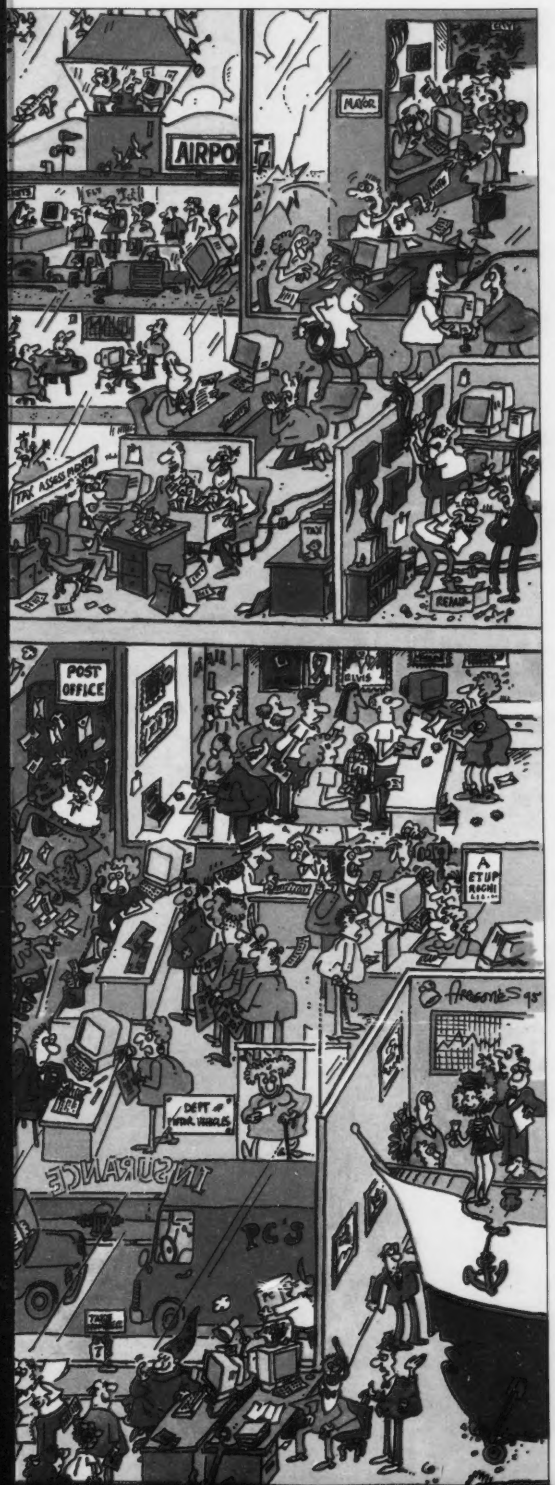
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This is the sixth in a series of short essays on the benefits of groupware technology. To receive a bound set of all the essays, please call **1-800-828-7086 ext. B162**. *Or explore Lotus on the World Wide Web at* **www.lotus.com**. *©1995 Lotus Development Corporation, an IBM subsidiary, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, Lotus Notes and Working Together are registered trademarks and Network Notes and Notes are trademarks of Lotus Development Corporation. OS/2 Warp and AIX are registered trademarks of IBM Corp. AT&T is a registered trademark of AT&T Corp. All company names are respective trademarks of their companies.*

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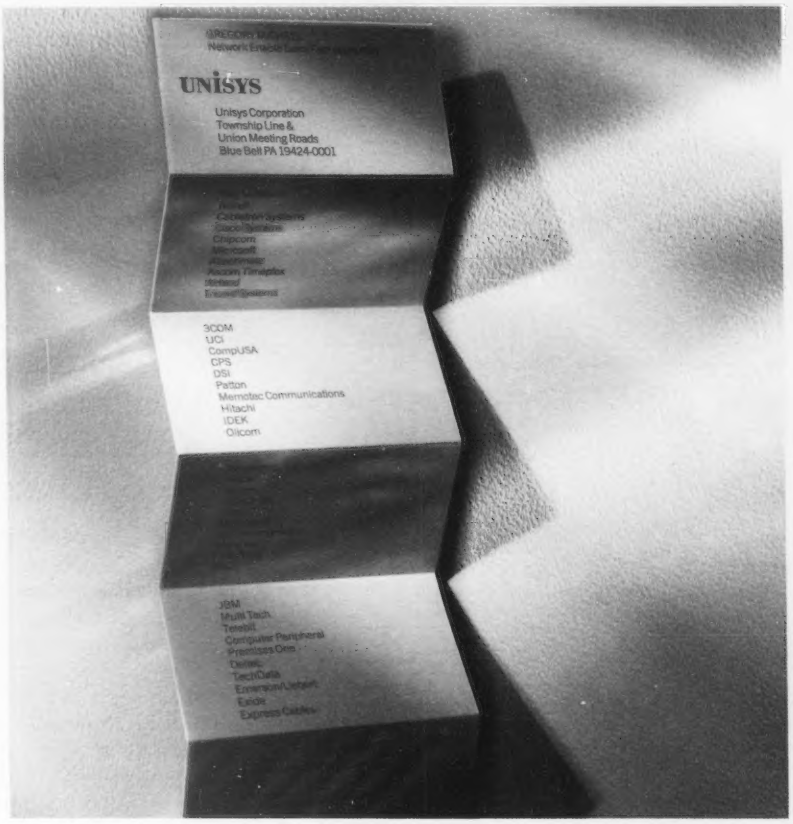
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HOUSTON UTILITY PLUGS IN TO OPEN SYSTEM, 104
NEW PRODUCTS, 108

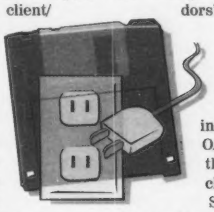
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Client/server comes alive

Open Applications Group ushers in the era of mix-and-match, multivendor applications

By Julia King

Now that the Open Applications Group, Inc. (OAG) has successfully demonstrated its specification for multivendor application integration, at least two members of the vendor consortium plan to deliver snap-together client/server enterprise systems as early as next year.



What remains to be seen is whether the mix-and-match capabilities built in to the products lead to significant reductions in the high cost and hassle factor now associated with systems integration.

"If the OAG concept becomes a reality, it will allow us to pick the best product that does the job for the business," said Jim Onalfo, chief information officer at Kraft Food International in Rye, N.Y.

Now, "we spend a lot of time integrating and interfacing different programs," he said. Under OAG's plan, by contrast, such integration would be available on a plug-and-go basis.

Simply stated, OAG's concept is to furnish users with multivendor client/server applications that can be integrated out of the box without additional software interfaces. Extra interfaces wouldn't be needed because the applications would pass data to one another in a format that all could understand.

Earlier this month, OAG demonstrated the concept by integrating three vendors' inventory applications with four other vendors' general ledger applications. Each vendor's software contained an application programming interface (API) written to OAG's message format spec, the Business Document Exchange.

Subsequently, Marcam Corp. in Newton, Mass., a maker of manufacturing software, and Coda, Inc., a Manchester, N.H., supplier of client/server financial applications, announced they would deliver OAG-compliant products during the first half of 1996.

"What OAG has come up with is a content format," said John Mann, research director of client/server computing at The Yankee Group in Boston.

Under that format, all applications can

Multivendor apps, *page 105*

Software 2000 delivers object-based version of its financial applications suite for IBM's AS/400

By Craig Stedman

The client/server awakening of the AS/400 continued last week when Software 2000, Inc. released an object-based version of its financial application suite that runs on the IBM midrange system.

Earlier this year, Software 2000 was the first major AS/400 business application vendor to field a bonafide client/server product. The Hyannis, Mass., company's Infinium line, which recasts the company's earlier AS/400 software in object form at the client and LAN server levels, debuted in February with a human resources offering.

System Software Associates, Inc. and Lawson Software have since released client/server financial products for the AS/400. Several other vendors from both the AS/400 and Unix camps plan to get in the game later this year and in 1996.

All are taking advantage of new database, TCP/IP and PC connectivity features that IBM built into the AS/400's operating system to reduce the minicomputer's host-centric nature.

Several AS/400 customers who have ordered Software 2000's new Infinium:Financial Management software said it should streamline work done on the desktop. Particularly helpful, they said, is the software's support for defining routine business tasks as objects.

But the shift to client/server mode on the AS/400 will be done at a moderate pace, the customers added.

AS/400, *page 105*

Run the numbers

Features for Software 2000's object-based Infinium financial applications

Technology	Availability	Price
Servers		
AS/400	Now	Starts at
Unix,	Next year	$53,000
Windows NT		
Clients		
Windows 3.1	Now	$1,500 to
OS/2	Now	$3,000 per
Windows 95,	Q1 1996	seat
Windows NT		

Key functionality

- Business objects represent tasks such as invoicing and budgeting
- Drill-down capability for finding more detailed data
- Customizable GUI
- Tool bar access to spreadsheets and word processors

On-line database helps child welfare workers

By Mitch Betts

Front-line social workers trying to help abused or neglected children may have the toughest job in state government, experts say. They face high public expectations, piles of paperwork and ever-increasing caseloads.

So when the federal government offered to pay 75% of the cost of a client/server system to automate the paper-intensive work, Oklahoma jumped into action. Working with contractor Deloitte & Touche, the state's Department of Human Services built a case management system in 13 months and rolled it out to all 77 counties by June 27.

"That's very quick. Similar state welfare systems have taken as long as four years," observed Michele Walsh, vice president for public sector market analysis at G2 Research, Inc. in Mountain View, Calif.

The federal government pays 50% of the cost of many state welfare automation projects, but Congress offered the 75% "enhanced funding" to states that build child welfare systems by Oct. 1, 1996.

At least nine states are in various stages of system development, but only Oklahoma has actually finished a statewide case management system under the federal guidelines.

The technical architecture for the so-called Oklahoma Kids Project features a high-end, centralized database server at an Oklahoma City data center, application servers in the counties and PCs for 1,050 caseworkers (see chart), according to Jon Williams, project manager at Deloitte & Touche's Pittsburgh office.

The results are starting to show. "We're beginning to see an increase in productivity in the counties where we can investigate more referrals, see more people in the field and spend less time doing paperwork," said Dicy Perry, the Kids project director who serves as a liaison between the users and technical staff.

In essence, the child welfare agency investigates cases of child abuse and neglect, decides whether the child should be placed in foster care and provides services to help the troubled family.

Using a graphical user interface, a case worker plugs key details into on-screen forms whenever a report of alleged child abuse is phoned in. "Pick lists" are provided so users can quickly select standard terms to create a concise and accurate report, Perry said.

Supervisors track the progress of cases, manage the workflow and determine which cases are high priority. "If it's life-threatening, we investigate within 24 hours," Perry said.

The Oklahoma Kids architecture

Oklahoma built the first statewide client/server system for child welfare in only 13 months. The system has the following elements:

DATABASE SERVER:
A four-processor HP 9000 Model T500 running Unix and Oracle7.1 relational database management system.

WIDE-AREA NETWORK:
TCP/IP over frame-relay lines leased from Southwestern Bell.

APPLICATION SERVERS:
Pentium servers in 81 offices running Novell NetWare. On-line applications are written in Powersoft's PowerBuilder 4.0.

Link to justice

The system can generate ad hoc statistical reports for planning and identifying gaps in service delivery. It also has on-line links to the state's juvenile justice system. "The legislature feels we need to know how many children have been in the child welfare system who later break laws and become juvenile justice clients," Perry said. "It's a way to judge the effectiveness of our services."

Oklahoma invested $7.5 million in the Kids project and received nearly $23 million in federal funding.

TravelNet system grounds travel budgets

By Julia King

This year, biotechnology giant Chiron Corp. expects to cut overall travel and entertainment expenses by 10% and realize a 30% productivity gain in its corporate travel department.

The $1 billion Emeryville, Calif., company hasn't restricted employee business travel or bought its own corporate jet. Rather, the savings will come, in part, from tracking employees' travel plans and costs in real time rather than after the fact.

Chiron, which spends about $8 million annually on domestic air travel alone, is deploying a new breed of client/server software from TravelNet, Inc. in Sunnyvale, Calif. (see story at right).

The Unix-based travel management system was announced last week and is the first to hit the market, said Robert Langsfeld, a travel management and automation consultant based in Incline Village, Nev.

By automating travel management, "most companies will get a 20% to 25% savings," Langsfeld said.

"It is a great opportunity to control the process rather than have the process control you," he added.

Kenneth Grunzweig, president and chief executive officer of TravelNet, said the software provides a corporate system for maintaining "travelers' profiles, preferences and [electronic-mail] addresses."

Users can type in when they want to arrive or depart from a location, pick an airline and then the system builds an itinerary, he explained.

Unlike on-line versions of the Official Airline Guide or other airline information systems, the TravelNet system can also book flights, hotel reservations and car rentals, Grunzweig said.

Grouping these capabilities leads to more efficient and less expensive buying decisions, said Mary Savoie Stephens, Chiron's travel manager.

"I could negotiate some very favorable discounts from vendors, but if the employees didn't choose these vendors when making their travel arrangements, that effectively neutralized the discounts," she said.

"I am looking at no more than six months to a year for a return on investment in the system," she added.

Stephens said an in-house agency continues to book Chiron's airline and hotel reservations and car rentals. The difference is that Chiron's travel department has on-line access to current bookings and all historical travel data. Before, such data wasn't readily available.

Using TravelNet, Stephens can tap into current data to negotiate better discounts with providers. Chiron's accounting department can also keep closer tabs on ongoing travel costs and predict them more precisely.

Stephens also sees the system as a safeguard against having to pay volatile per-transaction fees that travel agencies may levy for researching flight and other travel information.

In April, most airlines placed a $50 cap on commissions they pay to travel agencies. This has left agencies scrambling to recoup an estimated 30% loss in revenue. One strategy has been to charge customers for looking up information, which accounts for about 75% of what travel agencies do, Stephens said. But with TravelNet, Chiron's employees can look up that same information on-line themselves.



Up, up and away

U.S. corporations spent $143 billion, or about $3,000 per employee, on travel in 1994. The latter figure is three times larger than it was in 1985 when per-employee travel spending averaged $900, according to American Express Travel Services.

System in flight

TravelNet's Unix-based corporate travel management system gives users direct, real-time access to airline computer reservation systems.

Users also have simultaneous desktop access to employers' travel policies, information about preferred providers and prenegotiated corporate discounts.

The system is written in PowerBuilder and C++ from Powersoft Corp. It runs on Windows clients and Sun Microsystems, Inc. Solaris servers with any Open Database Connectivity-compliant database on the back end.

Pricing for the software starts at $125,000. Alternately, users can pay for the system on a per-transaction basis, with prices ranging from $5 to $12 per transaction. — *Julia King*

KeyCorp automates, strikes ATM balance

By Thomas Hoffman

Like most banks, Cleveland-based KeyCorp used to balance and reconcile its automated teller machines (ATM) manually. Clerks would type the daily ATM balance information onto DOS-based workstations running Lotus Development Corp. spreadsheets, which were then uploaded to the bank's mainframes.

The bank, which has $67.5 billion in assets, also had its hands full tracking and resolving customer ATM disputes within the federally regulated 10-day period using manual research procedures.

With plans to increase its ATM population — from 1,200 machines in 1994 to more than 6,000 by 1997 — the bank would have been hard-pressed to maintain service levels without increasing its 35-person back-office staff.

To meet these challenges, KeyCorp began rolling out late last year ATM Operations Workbench, a homegrown client/server-based system that was developed by the bank's technology services arm, Key Services Corp.

KeyCorp
Cleveland

Challenge
To accommodate anticipated fivefold growth in its automated teller machine (ATM) operations and improve service levels without hiring more staff.

Technology used
- Compaq 486-based DeskPro PCs running Windows 3.1
- Compaq ProLiant 2000 server running Microsoft's Windows NT 3.5
- Oracle7 relational database management system
- Novell NetWare 4.12-based LANs
- 3270 and terminal emulation to IBM and Tandem mainframes

Anticipated benefits
$2.1 million savings annually after 1997 while maintaining current staffing levels; more time for ATM operations staff to research and settle customer disputes.

Significant savings

The bank expects to save more than $1 million in annual back-office staff costs by 1997 as it centralizes ATM balancing and customer dispute resolutions under this client/server system. After 1997, KeyCorp hopes to save roughly $2.1 million per year by not having to increase its ATM operations staff, bank officials said.

KeyCorp spent less than $800,000 to develop the system and add the necessary hardware and software. The system was designed to automate and speed ATM balancing and customer dispute resolutions, said Robert Gardner, the chief technician for the project.

For example, staff at KeyCorp's Tigard, Ore., and Dayton, Ohio, ATM processing centers used to input ATM balances from each branch's general ledger printouts onto Lotus spreadsheets, said Be Nguyen, assistant vice president of ATM accounting and an ATM Operations Workbench user. The task would take staff members up to four hours each day.

Now the data is downloaded nightly via IBM SNA connections from the bank's data center mainframes in Albany, N.Y., and Cleveland into Novell, Inc. NetWare 4.12 LANs in Tigard and Dayton.



KeyCorp's *Kelly Riedel, Robert Gardner and Robert Geschke. The bank hopes to increase efficiency by automating ATM balance information.*

As a result, KeyCorp's ATM operations staff is spared 40,000 combined daily keystrokes. "The former process was very inefficient," said Kelly Riedel, vice president and manager of operations services at KeyCorp.

Less lag time

Under Federal Regulation E, which governs electronic transactions, banks must resolve customer claims within 10 days.

KeyCorp's customer service representatives "were in a constant battle to meet deadlines" because the methods used by the bank to research customer disputes were manual-intensive and slow, Riedel said. KeyCorp handles roughly 15,000 customer disputes each year.

Under the old system, customer disputes were entered into a branch system, printed and mailed to one of the bank's ATM operations centers — thereby putting a three-day lag on problem resolution. Because the automated client/server system delivers that information electronically on a nightly basis, customer service representatives now have two more days to research each incident.

"We like to resolve disputes within five days," said Debbie Rea, vice president of ATM operations at KeyCorp.

THREE GREAT REASONS TO TRY THREE GREAT PRODUCTS.

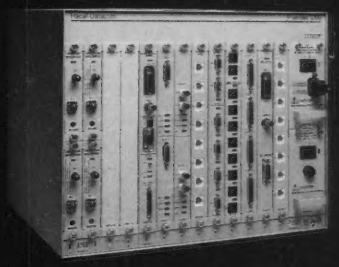
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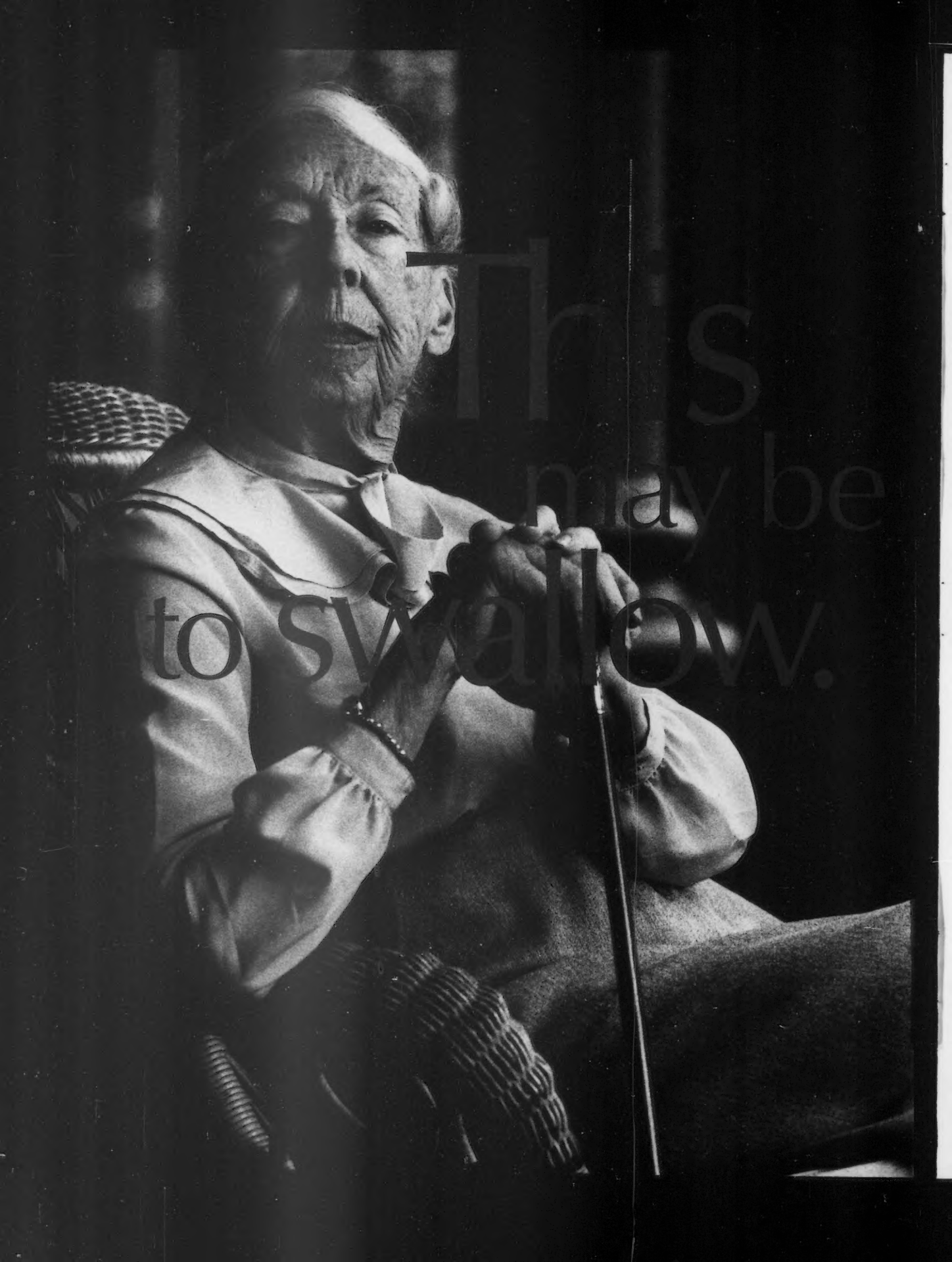
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may be
to swallow.

hard

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See, I had a chance like that once, long before there were any computers, and big Fortune 500 companies were even usin' processors like that quick little MIPS RISC thing.

It was the summer of 1908. The hot one. I was enjoyin' the breeze from the sun porch, when I saw a young man lookin' right through the screen. Scared me near to death.

'Howdy miss,' he said, 'I'm sure you're aware of this new refreshment that's sweepin' the south.'

Then he held up that bottle.

'Well,' he went on, 'we're lookin' for investors, 'cause we want to expand.'

Then I said, 'Mister, I sure do like your drink, but tryin' new things like that really isn't in my nature.'

'Suit yourself', he says, tips his hat, and walks away.

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Houston utility plugs in to open system

By Michael Goldberg

The demand for an open systems platform at the Houston Lighting & Power Co. nuclear reactor had as much to do with technology as the drive to cut expenses.

The utility spent the summer installing a Sequent Computer Systems, Inc. Unix-based symmetrical multiprocessing (SMP) system at its South Texas Project nuclear reactor in Bay City, Texas.

The system is expected to save the utility an estimated $20 million over the next five years. The savings will come from reduced staffing, maintenance expenses and licensing fees.

Lone Star State shines

Houston Lighting & Power picked Sequent hardware to run an Oracle database management system at its South Texas Project nuclear reactor. The utility is using the following:

A cluster of two SMP servers, Symmetry SE60s, each with 10 Pentium processors and 2G bytes of memory for production work at the plant

A cluster of two SMP computers, Symmetry SE20s, each with two processors for testing and application development

Al Atkisson, manager of information systems at the South Texas Project, said the anticipated deregulation of the power industry in the next few years prompted his company's conversion from an IBM ES/9000 mainframe to the new system.

"We wanted to position the site to make sure we were in the middle of the open systems stream," Atkisson said. The utility needed to cut expenses immediately so that its cost of providing electricity would be competitive once deregulation occurs.

Shining bright

Houston Lighting and Power serves a 5,000-square-mile area and is the nation's ninth-largest electric utility in terms of kilowatt sales.

The company decided in June 1994 to adopt an open systems platform for two mission-critical functions at the South Texas Project: tracking maintenance schedules at the reactor and monitoring workers' radiation exposure. That is also called the "health physics" at the plant, as prescribed by the federal Nuclear Regulatory Commission.

The utility chose a cluster of Sequent's Symmetry servers after examining massively parallel hardware offered by IBM, Pyramid Technology Corp., AT&T Global Information Solutions and NCube Corp. along with SMP models from Hewlett-Packard Co. and Sun Microsystems, Inc.

The mainframe conversion project took about five months. The company worked with Emergent Corp., a San Carlos, Calif.-based systems consultant.

The project wasn't without its painful moments.

Moving data off a legacy Pick Systems, Inc. database to Oracle Corp.'s relational format was difficult, officials said.

"The Pick environment doesn't map very well to a relational environment. A big part of the project was to make sure they didn't lose data," said Kevin Jernigan, a managing director at Emergent.

But the utility chose Sequent's SMP version because it provided the system failover needed for the utility's around-the-clock operation, Atkisson said.

It also provided the most stable environment for the company's chosen Oracle7 parallel database management and application development software.

Moreover, managers at Houston Lighting & Power liked Sequent's plans to develop a massively parallel platform in the future, Atkisson said.

When's the perfect time to switch to ATM?



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AS/400

CONTINUED FROM PAGE 99

"This is going to let us capitalize on our investment in desktop hardware. The AS/400 will just become a server down to my PC rather than me having to reach out to it every time I do something," said John Millward, manager of accounting services at Alberta Pacific Forest Industries, Inc.

The Canadian pulp mill, which is located north of Edmonton in Athabasca, Alberta, plans to install the Infinium financials in early October. But the company isn't planning a wholesale change to Infinium.

The new financials and Software 2000's human resources product, which the mill also expects to buy, will be limited to about 40 users in those departments, Millward said.

The remaining 360 or so users at Alberta Pacific will still run Software 2000's earlier applications in terminal emulation mode. "For people who use the software on an ad hoc basis, it's not really worth" switching, he said.

Installations mixing client/server and terminal modes are possible because Software 2000 hasn't rewritten the procedural code that sits at the AS/400 itself.

That probably won't be converted to object form until 1997 or later, according to Erin Golden, director of marketing at Software 2000.

The lack of object support at the AS/400 end means Infinium users can't fully distribute objects across their computing environments.

While that capability could further streamline processing, Millward and other customers said Software 2000's go-slow approach is fine by them for now.

"We've got a whole variety of users out there, and they can sort of mix and match [Infinium and terminal-based software]. If you come out with something that forces everybody to go out and buy new PCs overnight, that's not going to go over very well," said Bernie Johnson, retail vice president at Electronic Data Systems Corp.'s Dealer Systems Division in Troy, Mich.

The EDS unit recently chose Infinium to replace homegrown AS/400 accounting software as part of its Dealerline product for auto dealerships. Infinium provides more sophisticated report writing and centralized accounting tools, Johnson said.

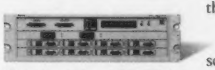
Looking ahead

Software 2000 products for Unix and Microsoft Corp.'s Windows NT should be ready sometime next year, company officials said. Those non-AS/400 releases will support databases such as Oracle and Sybase, they added.

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Multivendor apps

CONTINUED FROM PAGE 99

recognize and decode data from other applications. Precisely how they decode it, however, is left up to each vendor.

What is remarkable, according to both users and analysts, is the relatively short time it took the group to come up with and then agree on the spec. OAG software developers began work on the API less than a year ago, in December 1994.

Easy to understand

Perhaps even more important — and in sharp contrast to the work of other standards bodies — the spec seems to be fairly straightforward, analysts said. That should make for a smooth implementation.

"One of the beauties of this is that it works," Mann said.

"Instead of starting another religious debate, [the vendors involved] actually sat down and built some software that works together," said Steve Wright, president of OAG member Coda.

At least it works where inventory and general ledger transactions are involved. Now the task facing vendors is building the same functionality into their full range of applications. And given the way the OAG spec was jump-started, Wright, for one, sees that happening fairly quickly.

"That vendors could agree on formatting their data is a positive sign," he said.

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Dr. James H. Goodnight
President, SAS Institute Inc.

1

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2

Business Intelligence You've heard all the buzzwords (EIS, DSS, OLAP, Intelligent Query, Visualization). But what do they all mean? As a collection of incompatible products, they could mean trouble. But together and fully integrated into a comprehensive decision support environment, they could mean making good business sense out of reams of raw data. We provide them all. And we can design just the right mix for you.

3

Technical and Analytical Tools Of course, decision making is not unique to the business side. If you have quality issues on the shop floor or need to analyze the results of your market research, we can deliver the industry's richest set of tools for handling virtually any analytical need.

4

Applications Development If you need to build decision making into customized systems to get a jump on the competition, count on applications development tools ideally suited for decision support. Count on ours. Our iterative approach to rapid applications development can shave months off of your development cycles, and get the right information into the hands of your decision makers faster.

5

Business Solutions Maybe you're not ready to tackle that system alone. You won't have to. Our professional services staff can help you as much (or as little) as you require. We can train you, sit beside you, or build complete decision-based applications to your specific requirements.



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New Products

Box Hill Systems Corp. has unveiled RAID Box 5300 Turbo.

According to the New York company, RAID Box 5300 Turbo has a capacity of 4G bytes to 432G bytes. The product supports up to 512M bytes of data cache that can be specified as write-back or write-through. It was designed to achieve up to 4,500 I/Os per second and a total sustained throughput of more than 60M byte/sec.

RAID Box 5300 Turbo can implement RAID Levels 5, 4, 1, 0+1 or 0.

Pricing for RAID Box 5300 Turbo starts at $1 per megabyte.

▶ *Box Hill Systems*
(212) 989-4455

Walker, Richer & Quinn, Inc. has announced that Reflection 3270 can access IBM mainframes via an SNA gateway.

According to the Seattle company, Reflection 3270 gives desktop users precise terminal emulation to IBM mainframes through TCP/IP or SNA gateways, including Microsoft Corp.'s SNA Server gateway.

Reflection 3270 includes features for full host printing, hot backup and automatic load balancing. The Reflection SNA Server Option supports desktops running TCP/IP, IPX/SPX, NetBIOS or Banyan Systems, Inc.'s Vines.

Reflection 3270 costs $299 for a single-user copy.

▶ *Walker, Richer & Quinn*
(206) 217-7100

Cambar Software, Inc. has introduced Task Optimization, an extension of its Client/Server Warehousing software system.

According to the Charleston, S.C., company, Task Optimization adds labor management fuctionality to Cambar's warehousing software product line.

The product directs users through multiple series of tasks by prioritizing warehousing tasks. It matches tasks with equipment and workers based on locations, and it reduces equipment downtime.

Task Optimization automates equipment codes and physical locations. It groups locations that can be worked on by the same person. The software system automates all warehouse functions including order pooling, inventory control and report generation.

Task Optimization can have a Hewlett-Packard Co. HP 9000 or IBM AS/400, RS/6000 or ES/9000 as the database server.

Pricing for Task Optimization starts at $150,000.

▶ *Cambar Software*
(803) 747-4900

Byteware, Inc. has introduced Visual Control 1.0, a real-time monitor for IBM's AS/400.

According to the Grass Valley, Calif., company, Visual Control 1.0 lets users monitor one or more local or remote AS/400s from one graphical user interface.

Users can access systems data including communication lines and battery status, response times, page faults, security and remote systems. The product displays on-line performance information and resource usage trends.

Visual Control 1.0 has customizable alarms that can be set to alert users when system resources exceed a user-defined threshold.

Visual Control 1.0 costs $995 for each AS/400.

▶ *Byteware*
(916) 273-4595

Andrew Corp. has announced Emerald Client for Windows 95.

According to the Orland Park, Ill., company, Emerald Client for Windows 95 provides IBM 5250 terminal and printer emulation to the AS/400 for PCs running Microsoft Corp.'s Windows 95.

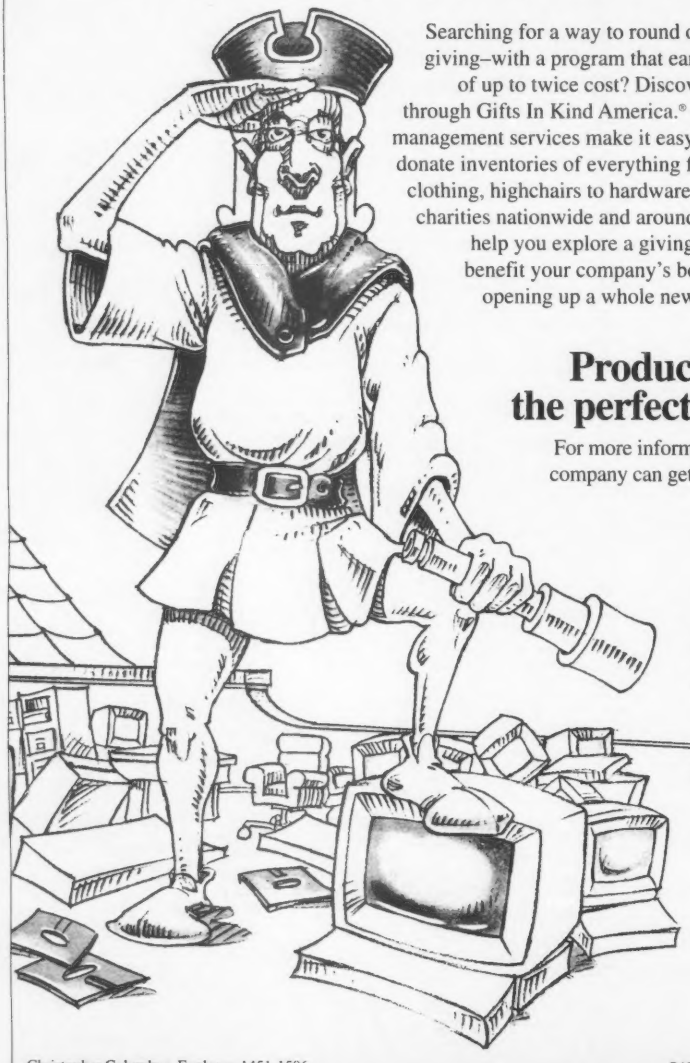
The product provides connectivity through Microsoft's SNA Server and IBM's Display Station Adapter.

Emerald Client for Windows 95 has a single display interface, which lets users run many copies of Emerald Client. The product allows multiple 5250 terminal sessions and a transparent window into the host.

Emerald Client for Windows 95 costs $245 for a single user.

▶ *Andrew*
(708) 349-3300

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SAS INSTITUTE INC. VOLUME 5, NUMBER 3

THE SAS®

DECISION SUPPORT SYSTEMS
ON TARGET WITH CHANGING NEEDS

THE ANSWER FOR TODAY'S DATA-RICH,
YET INFORMATION-POOR, ORGANIZATIONS

MANAGEMENT REPORT

NEWS, TRENDS, OPINIONS, AND IDEAS FOR INFORMATION MANAGERS

Creating a Model for Informed Decision Making *(You'll Find the Plans in Our Free Applications Development Guide)*

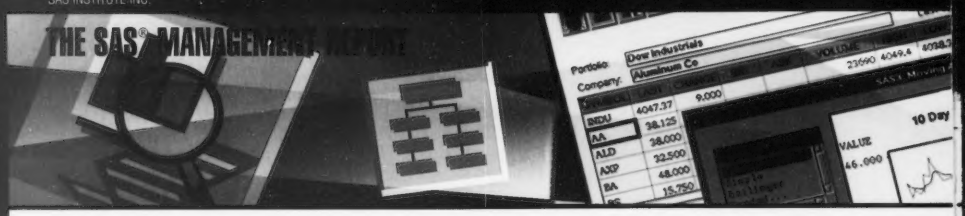
Transaction-oriented applications are firmly established in most organizations. But full-scale enterprise information delivery requires another model. Empowering today's decision makers with the right information, at the right time, is a challenge few tools can meet.

In this MANAGEMENT REPORT, SAS Institute's Mark Moorman—Program Manager, Applications Development—examines tools for information delivery based on such success factors as *scalability*, *portability*, and *applications partitioning*. And he finds there's only one logical choice for meeting the information needs of today's knowledge workers.



"Delivering applications has traditionally been a matter of specifics: a specific high-volume activity such as order entry, a certain hardware platform, a limited applications life cycle," says Moorman. "More and more companies are expanding their expectations beyond operational applications to encompass enterprise-wide information delivery applications. And they're reaping tremendous rewards—from more cost-effective use of system resources to more informed decision makers."

continued on next page

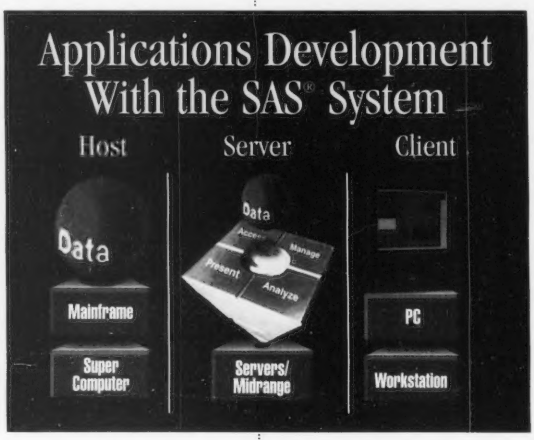


Getting Data Into the System Shouldn't Be an End in Itself

According to Moorman, traditional operational (OLTP) applications involve automating redundant processes, such as updating large databases concurrently while maintaining the integrity of the data. Because the tasks are done over and over—entering new orders, for instance—these applications must be easy to use while protecting the repository as new data are continually added. "From a developer's standpoint, much time and energy is spent in designing the graphical user interface for data entry, and on effective throughput to keep the data flowing," says Moorman.

While getting data into the system is critical, so is the **information** you get out of the data—especially in terms of moving the organization forward. "Applications delivery shouldn't exist in a vacuum," says Moorman. "It should provide a framework for reaping the full rewards of data warehousing and business intelligence applications, allowing your knowledge workers at every level of decision making to access just the right data, and analyze it in just the right way, to arrive at the right business decisions."

That's why the move is on to deliver open-ended information delivery applications—with heavy emphasis on data query, analysis, visualization, and presentation.



"Because transaction-oriented applications center on single tasks and maintaining data integrity, they're usually built using a life cycle design. There's a stage of investigation, followed by design and analysis. Then comes development, which is followed by a prolonged implementation period and continuous system management," explains Moorman.

Taking an Iterative Approach Keeps Decision Support Systems on Target with Changing Needs

Instead of a life-cycle design, enterprise-wide decision support systems should rely on an **iterative** approach in both their design and deployment. "Taking an iterative approach means prototyping applications quickly and delivering them without a lot of fanfare," says Moorman.

"Because of its iterative design, the application can then be continually reshaped in response to client needs. For instance, a client might ask to add a button for graphing last month's sales. Another might want a button for forecasting next year's profits. Or maybe a whole new product line comes into play. The point is that the business needs never stand still," Moorman explains.



Having All the Right Tools Makes Building Any Application Faster and Easier

While transaction-oriented applications are built for heavy-duty data **input**, information delivery applications are geared toward heavy-duty information **output**. "That means looking beyond screen interaction to enable users to actually interact with your enterprise data," says Moorman.

"A decision support system starts with accessing data, from any source and in any format, across multiple hardware platforms. This is followed by an analytical layer, where hundreds of ready-to-run applications can be applied directly to the data for trending, ranking, forecasting, and so forth. Then comes the graphical user interface (GUI), which presents all these choices while providing a palette for asking questions about the data, visualizing the data, and requesting any kind of report or graph."

Any part of the application should be executable across all the hardware platforms in the enterprise. "It may be that the data resides on a host mainframe while the GUI is on a client PC, and some of the application logic is performed on a UNIX® server," Moorman says. "An enterprise approach allows an application designed for a single user or department to be easily shared and modified by any other department, so it's vital that each application be easily scaled upward to accommodate more data or users."

Moorman advises organizations deploying enterprise-wide decision support applications to look for software that provides scalability (so that applications adapt to a growing user or data population)...portability (so that data and applications can be easily shared in a client/server environment)...and applications partitioning (so that portions of an application can be moved directly to the data).



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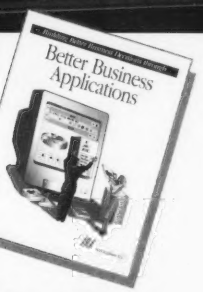
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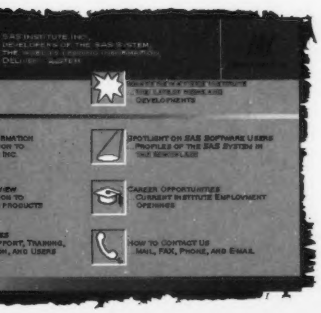




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Applications Development Survey

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1. What is the biggest obstacle you face in delivering applications to your enterprise decision makers?

_____

_____

_____

2. Are your current applications development projects more:

___ transaction-oriented
___ oriented toward enterprise-wide information needs

Do you foresee your approach to delivering applications changing in the next 12 months? Why or why not?

_____

_____

3. Are you...

___An IT professional who supports knowledge workers
___A knowledge worker who uses decision support tools
___An executive who reviews the results of business analysis

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THE IT PERSPECTIVE

MARK MOORMAN

Enterprise Decisio Systems: The Answe Data-Rich, Yet Inform Organizatio

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Scalability and Portability

For organizations that need enterprise-wide scalability is critical. Smaller, client-based fill the need. On the other hand, true enter including those designed for small groups scaled up to meet the requirements of mo more platforms.

In addition, most companies too computing environments, which require b portability. An exclusive MultiVendor Archi System, and the applications you build wit independent. This frees up IS departments applications in and across platforms. And applications across systems without modif

Applications Partitioning

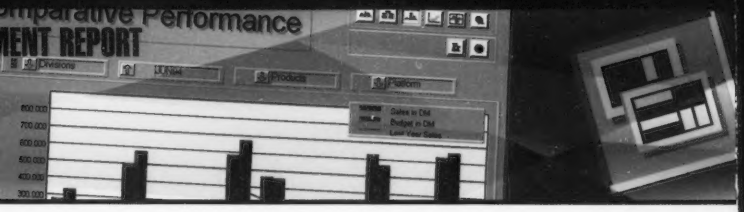
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nies today have heterogeneous quire both application and object or Architecture™ makes the SAS uild with it, virtually hardware rtments to port and execute ns. And it enables users to run t modification.

r an application to execute on the X server, or a PC—than transfer- sy corporate networks. We've built that you can reduce network r computing resources.

Object-Oriented Tools

Object-oriented technology offers the promise of quicker applications development, easier maintenance, and reusable code. The SAS System's fourth-generation language provides an easier way to implement object-oriented principles. There's even an object library that allows end users to apply the functionality of any object directly to their data...or to build their own customized objects.

Interoperability



Mark Moerman
Program Manager, Applications Development

Because most organizations rely on applications, tools, and data from a variety of vendors, interoperability among all elements is essential. That's why SAS Institute now enables you to open SAS-managed data to third-party products via the Open Data Base Connectivity (ODBC) standard. We recognize the need for interoperability among objects and object-oriented applications, as demonstrated in our support for OLE 2.0 and other standards.

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Dynasty seeks own identity in the client/server future

By Frank Hayes

You would have thought they were twins. Years before either Dynasty Technologies, Inc. or Forte Software, Inc. began shipping products, analysts regularly mentioned them in one breath as the wave of the future for distributed client/server development.

Now Lisle, Ill.-based Dynasty is trying to break away and show users it is better than competition from above and below. The company has begun shipping a new version of its high-end development environment. Dynasty 2.0 adds automated partitioning and rapid development capabilities as well as much-improved support for databases and communications.

Client/server development

Users' needs

"We wanted three-tier client/server, open systems, Unix, Oracle, and we were very much looking for productivity," said Art Lindgren, vice president of TCAM Systems, Inc., a New York consultancy that is using Dynasty to help develop trading systems for the Vancouver Stock Exchange. "The learning curve is fairly steep, and it's a long hill, but the productivity gains are significant."

The new features include support for databases from Oracle Corp., Sybase, Inc. and IBM's DB2/2 as well as Novell, Inc.'s Tuxedo transaction manager. Also included are rapid development tools for quickly assembling Dynasty objects from a business application point of view.

Once created, the application can be partitioned among several platforms by dragging business objects into groups or allowing an automated Partitioning Assistant to group them. Dynasty then generates C code for DOS, Microsoft Corp.'s Windows NT, OS/2 or Unix, along with communications code to link the platforms.

In the thick of things

With the new release, Dynasty is "right in the sweet spot in the market," said Dave Sanders, senior vice president of technology and development at U.S. Computer Services, Inc. in Rancho Cordova, Calif. "Nobody today that I know of is seriously building large, new commercial applications with mainframes. And the low-end tools are great, but try to find somebody running them who's got more than 50 users hooked up to a system."

Analysts said Dynasty tries to distinguish itself with its openness, including support for third-party systems management and communications middleware ranging from traditional Unix remote procedure calls to the Open Software Foundation's Distributed Computing Environment. Rivals such as Forte and SeerHPS from Seer Technologies, Inc. in Cary, N.C., use proprietary middleware.

Still, Dynasty may not yet have convinced even satisfied users that it is a cut above its competition. "We have been pleased with this. Our productivity gains are from two to eight times, depending on what we're doing," Lindgren said. "What we don't have is any comparison, real or imagined, with other products."

Dynasty 2.0 costs $7,995 in addition to a one-time fee for each target platform. There are no runtime fees.

Microsoft gets help with enterprise development

Third-party vendors try to fill gaps found in Visual Basic

By Frank Hayes

Can Visual Basic make the grade for enterprise-level applications?

Microsoft Corp. has taken its share of knocks for failing to meet enterprise needs, particularly with its development tools. While the Redmond, Wash., software giant has been busy developing customizable packaged software such as its BackOffice suite for large organizations, its most popular development tool, Visual Basic, has lagged.

But with the recently released Visual Basic 4.0, users are hoping the company has worked out some of the kinks in its efforts to make Visual Basic a tool that can be used for more than desktop applications.

"In the previous release, they were a long way from where they needed to be," said Olis Garber, manager of client/server development at Blue Cross/Blue Shield of Florida in Jacksonville. "Visual Basic stand alone as your enterprise solution? No way."

Hoping to close that gap, Microsoft assembled Visual Basic 4.0 with third-party vendors that have strong reputations in enterprise development tools, including Texas Instruments, Inc., Digital Equipment Corp., Magna Software Corp. and others (see chart).

The goal, according to Jon Roskill, Microsoft's Visual Basic developer relations manager, is to leverage the strength of other high-end developer tools along with Visual Basic's popularity and ease of use.

For example, developers can use TI's Arranger to link Visual Basic client applications with server business logic developed with Composer, the client/server version of TI's Information Engineering Facility mainframe computer-aided software engineering system. Or for re-engineering Cobol applications, developers could use a new version of Magna Software's Magna X, which will now generate front-end Visual Basic code.

Enterprise-level help for Visual Basic

Vendor/Product	Product type	Starting price/Availability
Atria Software ClearCase	Configuration management	$4,000/Q1 1996
Digital DECAdmire	Three-tier development environment	$675/Now
Intersolv PVCS	Configuration management	$499/Q4 1995
LBMS Object Manager	Object repository	$2,000/Now
Logic Works ERwin/ERX for Visual Basic	Application modeling tool	$3,500 (expected starting price)/December
Magna Software Magna X	Mainframe application generator	$8,000/November
Rational Software Rational Rose/ Visual Basic	Analysis and design tool set	$2,400/Q1 1996
Texas Instruments Arranger	Three-tier development environment	$2,990/Now

But so far, the new additions to the Visual Basic third-party roster don't seem to be making many converts. Visual Basic true believers are already plowing forward into large-scale development, while the unpersuaded say they will wait and see.

"We're going to use VB to front-end to all our VAX applications and also to build business decision solutions," said Tom Mant, an analyst/programmer at Mary Kay Cosmetics, Inc. in Dallas, where a Visual Basic sales force automation application already has 750 users and will eventually scale up to 2,000.

But whether third parties can completely fill Visual Basic's gaps remains to be seen, Garber said.

The new release of Visual Basic also adds an Automation Manager, which allows OLE components to communicate networkwide. This is, in essence, a precursor to Network OLE, which Microsoft said won't be available until the next major release of Windows NT, scheduled to ship sometime next year.

But improving Visual Basic's reputation for enterprise development may require a lot more than riding the coattails of high-end vendors.

"We use the mainframe tools from Magna, and we've been evaluating Visual Basic with some others for the desktop," said Jack Botteron, data administrator at the Portland Public Schools in Portland, Ore. "The evaluator did not like Visual Basic. We're looking for something else."

Firms team to ease data warehousing

By Michael Goldberg

Users working on sophisticated data warehousing projects may find that vendor partnerships are easing the complexity of analyzing legacy data.

For instance, Pyramid Technology Corp. has used relationships with several companies such as Oracle Corp. to quietly build a track record of successful data warehousing projects, said Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston.

"They've had enough experience on their own in pretty good sized data warehousing projects," Sakakeeny said. All but the largest companies would need external assistance in building a data warehouse, "and you want to look for somebody that's not going to treat you as a guinea pig," he said.

Get your money's worth

A company going through the Pyramid and Siemens/Nixdorf pay-as-you-go data warehousing program could spend more than $1 million

- **$25,000** on start-up costs to analyze the potential for data mining.
- **$200,000** to **$250,000** on a 90-day demonstration designed to show its benefits.
- **$1 million** for hardware.

Pyramid in San Jose, Calif., recently prevailed over other **Data warehousing,** *page 111*

New Products

Diamond Head Software, Inc. has launched ImageBasic 2.1 for Delphi, an application development product for Borland International, Inc.'s Delphi.

According to the Honolulu company, ImageBasic 2.1 for Delphi lets end users and developers create production-level, customized document imaging applications. The product includes a component architecture that lets developers incorporate imaging functionality into business applications.

The ImageBasic document imaging components support a variety of optical character recognition-based automatic image indexing options. These options include hand-printed text, bar codes, check boxes and photographs.

ImageBasic's core system includes scan, display and print functionality and supports products from many imaging engine vendors.

Pricing for ImageBasic 2.1 for Delphi starts at $1,750; additional modules begin at $295, with additional per-seat licensing fees.

▶ *Diamond Head Software*
(808) 545-2377

Performance Software Group has introduced Facade 1.0, a graphical interface for Hewlett-Packard Co.'s HP 3000 MPE/IX system.

According to the Reston, Va., company, Facade 1.0 uses IBM-compatible PCs and keeps a communication link with the HP 3000 to provide a Windows programming and development environment. The product includes a text editor that lets users edit many files concurrently. It also lets users display and edit embedded control characters. It has full point-and-click support, cursor positioning for text entry and drag-and-drop capabilities.

The Facade 1.0 server runs under MPE/IX. Each client PC requires Windows 3.1 or later, 4M bytes of RAM and 2M bytes of disk storage.

Pricing for Facade 1.0 starts at $950. Multiuser license pricing is available.

▶ *Performance Software*
(703) 471-0076

Mortice Kern Systems, Inc. has introduced MKS Code Integrity 1.1, a code analysis tool.

According to the Waterloo, Ontario, company, MKS Code Integrity 1.1 is a C source code analysis tool for Unix platforms that acts like a spell checker for code by funneling the troubleshooting aspects of a development job into an automated tool. It consists of a code analysis engine, an application programming interface (API) database and a graphical user interface. It was designed to let developers identify and reduce unexpected system and architecture dependencies, access API and standards information and create portable and maintainable code.

MKS Code Integrity 1.1 is available for Sun Microsystems, Inc.'s Solaris and SunOS, Hewlett-Packard Co.'s HP-UX and IBM's AIX platforms.

Pricing for MKS Code Integrity 1.1 starts at $1,500 per developer seat.

▶ *Mortice Kern Systems*
(519) 884-2251

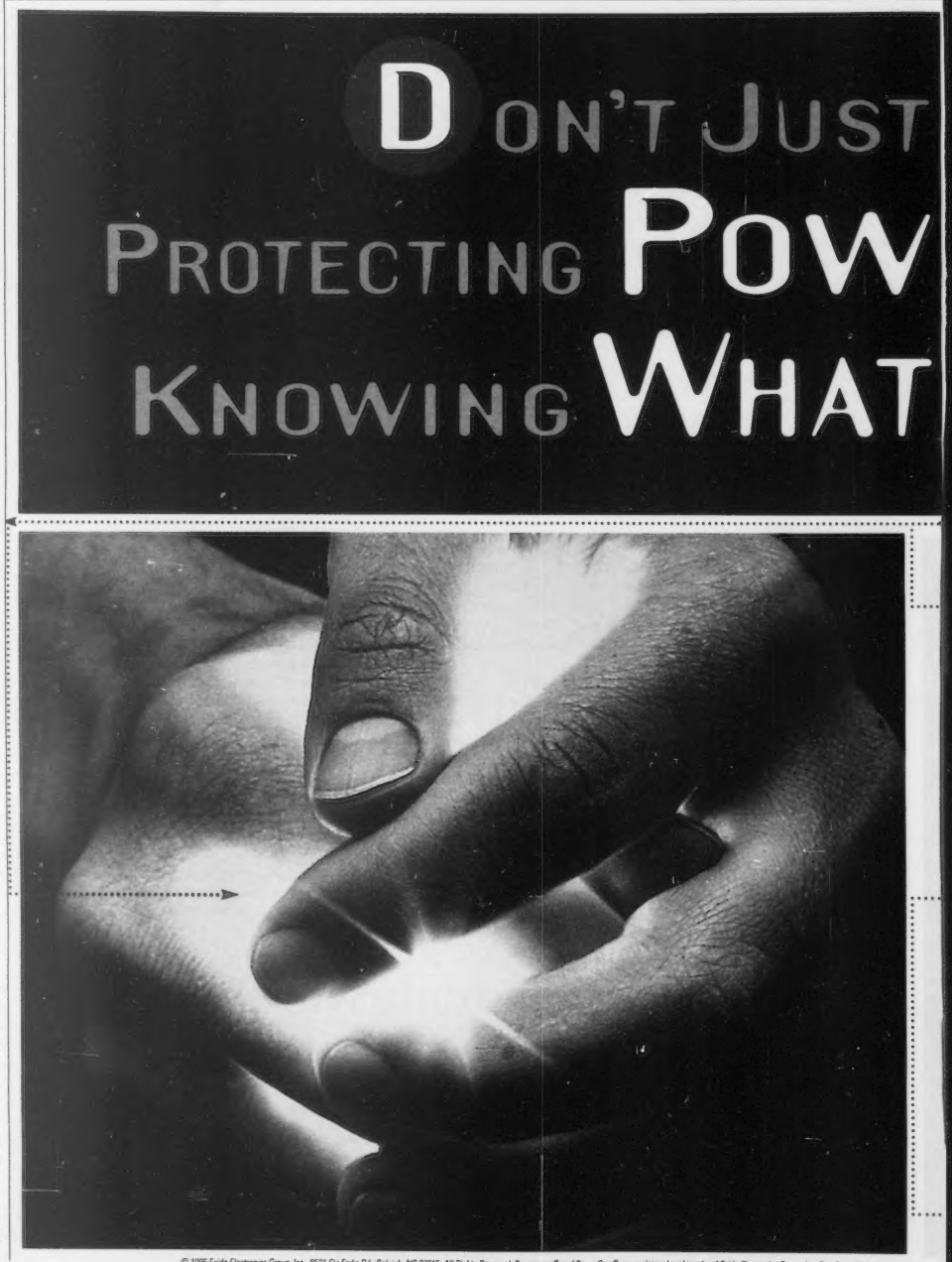
Imaging Technology, Inc. has introduced Itex-VIP (Visual Itex Programmer), a point-and-click programming product.

According to the Bedford, Mass., company, Itex-VIP is built on Imaging Technology's Itex, an intermediate language describing connections, operations and properties of the modules and pipeline timings. Itex-VIP was designed for machine vision integrators and developers and uses a graphing programming interface generating ANSI-standard C code.

Itex-VIP lets developers graphically connect the I/Os of each acquisition, computation, memory and display module in a system. It then sets the properties and operations for the modules using pop-up windows. Using an internal rules-based expert system, Itex-VIP automatically generates optimal C code that handles image processing pipelines, interrupts and multiprocessing. Users can reconfigure hardware and software to test new approaches to vision problems. It also lets programmers include user-written custom code fragments.

Pricing for Itex-VIP starts at $5,495.

▶ *Imaging Technology*
(617) 275-2700



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Data warehousing

CONTINUED FROM PAGE 109

hardware vendors in a competitive field after demonstrating smooth operations with Oracle application development tools and relational database management systems, said Jim Watkins at McKesson Corp. Based in San Francisco, McKesson is one of the nation's largest prescription drug distributors.

A major factor in McKesson's decision to pick Pyramid was the way the Nile parallel processing hardware performed on McKesson's benchmark tests.

"They simply did what they said they would do, and a lot of [hardware vendors] say they will and then don't do it," said Watkins, vice president of systems delivery at McKesson's information technology division.

McKesson is using three Nile 150 servers with Oracle software tools and a PC LAN. The company plans to scale from an initial database size of 250G bytes to approximately 1T byte and to go from a small core of users to hundreds in the future. In addition to improving inventory management, McKesson expects to earn revenue by selling some of its data mining results about sales of certain drugs.

At Cellular One in Columbus, Ohio, a regional mobile telecommunications firm serving Ohio and Michigan, information systems staffers are also prospecting their data for new promotional and product ideas based on trends in consumer behavior.

Patty Flynt, Cellular One's senior vice president of information services, said the company took up an Oracle offer to participate in a pilot program for telecommunications companies setting up data warehouses.

A little nudge

Aa a longtime Digital Equipment Corp. shop with 22 VAX minicomputer nodes supporting its business operations, Cellular One managers needed some persuading to install a box from a relatively unfamiliar player, Flynt said.

Pyramid "clearly understood our business issues as well as how to make this [data warehouse] technology be useful in a business," she said.

Cellular One is training a dozen "sophisticated users" from marketing, finance and customer operations to work with its data warehouse.

"Our goal is to be able to analyze what's going on in our customer base and create new promotions, new products. We're just now starting to see the fruits," Flynt said.

Pyramid and Siemens/Nixdorf last week started promoting a Smart Warehouse program aimed at larger firms with growing amounts of data in legacy systems.

Observers said Pyramid and Siemens/Nixdorf quietly have built up experience in data warehousing and now have assembled a package of software goods and consulting services to minimize the financial risk for firms thinking about starting their own data projects.

Pyramid has also done data warehousing work with Information Builders, Inc., Informix Corp., Sybase, Inc., Planning Sciences, Inc. and Coopers & Lybrand.

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Briefs

Reselling Oracle tools

Oracle Corp. said **IBM** and **Apple Computer, Inc.** plan to resell the forthcoming Oracle Power Objects graphical development tools. Power Objects, which is priced at $395 for a stand-alone Windows version and $1,995 for a client/server license, is Oracle's answer to **Microsoft Corp.**'s Visual Basic tools.

Tandem, Illustra team

Illustra Information Technologies, Inc. in Oakland, Calif., plans to port its namesake object-oriented database to run on multiprocessor machines from **Tandem Computers, Inc.** in Cupertino, Calif. The firms plan to merge the Illustra and Tandem NonStop SQL Databases "over time." The goal is to let on-line transaction processing and large data warehousing applications run on the same server.

Management

INSIDE:
New: Hot Happenings, page 117
Why simple can be stupid, page 118

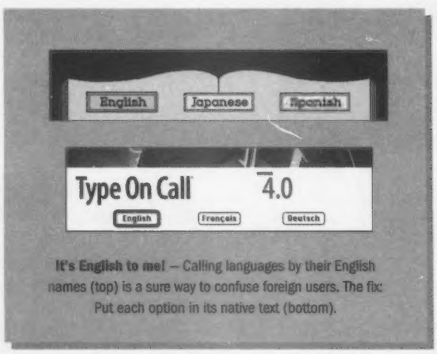


Tony Fernandes' *Global Interface Design: A Guide to Designing International User Interfaces* is available from AP Professional/Academic Press, Inc., 1300 Boylston St., Chestnut Hill, Mass. 02167

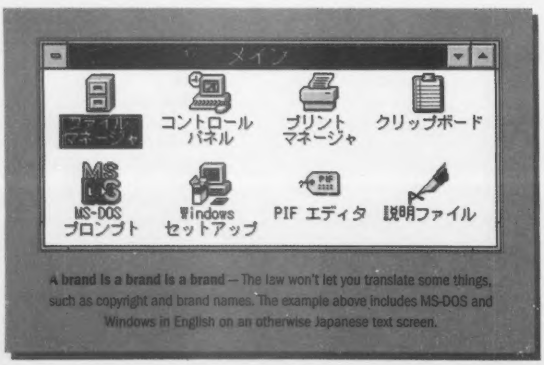
When GUIs and CULTURES COLLIDE

Innocent interfaces can lead to international incidents for designers at multinational companies. In his new book, **Tony Fernandes** shows how to steer clear of cultural pitfalls and taboos.





It's English to me! — Calling languages by their English names (top) is a sure way to confuse foreign users. The fix: Put each option in its native text (bottom).



A brand is a brand is a brand — The law won't let you translate some things, such as copyright and brand names. The example above includes MS-DOS and Windows in English on an otherwise Japanese text screen.

By Elizabeth Heichler

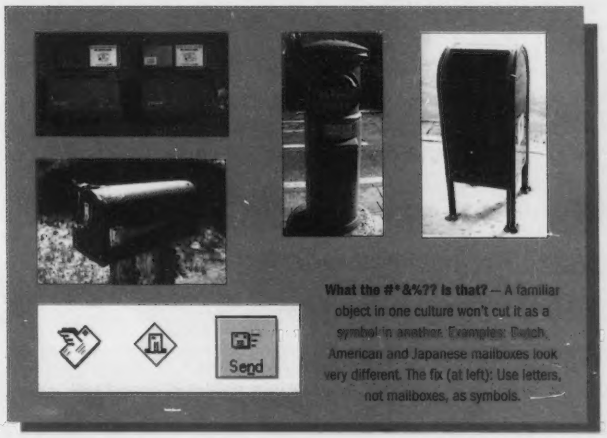
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But then again, they might not. The thumbs-up, taken in the U.S. as a sign of approval, means something obscene in Australia. It's an example Fernandes uses to illustrate why pictures of hands and hand gestures are design elements best omitted when an application is to be deployed cross-culturally.

Violating taboos is one risk developers take when they ship U.S.-developed applications overseas (see box, page 113). The author of *Global Interface Design* (1995, AP Professional/Academic Press, Inc., Chestnut Hill, Mass.) sees other risks, too. In an interview with *Computerworld*, Fernandes says expecting overseas employees to use an American-designed interface could result in higher training costs and poor productivity.

"If usability and low training costs are really important, you can't get there by producing a solution for just one population in a multinational company," says Fernandes, who is manager of the Human Interface Group at Claris Corp., a software company in Santa Clara, Calif. If software is to be used internationally, design it with all users in mind from the start. "Either pay at the beginning, when it's relatively inexpensive, or you will pay over and over again in higher training costs," he says.

There are many common elements in user interface design. Many use objects and images that are familiar to Amer-



What the #*&%?? is that? — A familiar object in one culture won't cut it as a symbol in another. Examples: Dutch, American and Japanese mailboxes look very different. The fix (at left): Use letters, not mailboxes, as symbols.



Color me happy! — Don't make your users blue by using the wrong color schemes, images or shapes. Note the differences in user-friendly versions of Microsoft Works clip art for Japanese (left) and American users (right).

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Lists of options are another element that can cause cross-cultural confusion. In many countries, people are accustomed to deleting items they don't want from a list and leaving untouched the items they wish to select. Yet many software applications require users to mark the items they wish to select by checking a box.

Other icons that make little sense outside of their American context include images of Rolodexes to symbolize an address file or images of mailboxes that look like U.S. Postal Service boxes, says Barbara Nassaney, manager of software localization services at International Communications, Inc. in Natick, Mass.



There's NO PLACE like home — Don't expect screens depicting American scenes, such as this one from *Grandma and Me*, to strike a chord with foreign users.

One multinational company that takes international interface design very seriously is DHL Worldwide Express. The company has three development centers — in the U.S., Europe and Asia — to address users' and customers' needs.

The company tries to ease the task of localizing interfaces. So DHL designs software applications to use one common logic engine, on top of which different interfaces are layered, says Alan Boehme, director of customer access and logistics marketing. This way, developers in each locale can design interfaces using their own sets of icons, color choices and even button styles, he says. ■

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You say tomato; I say taboo

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An excellent example is Microsoft Corp.'s "Bob" interface. Intended to make Windows easier to use, this software translates badly in other cultures, Fernandes says. "Bob" uses a series of characters based on animals. In other cultures, different animals can have sacred connotations or symbolize bad luck. Their use should be avoided, he advises.



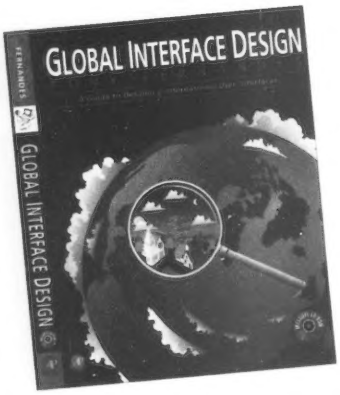
"Bob's" friendly dog guide would be unwelcome in cultures where animal images can have symbolic meaning.

Hand gestures are a minefield of inadvertent offensiveness. In addition to the thumbs-up sign, an open palm, peace sign and the "A-OK" sign of thumb and forefinger in a loop all carry very rude meanings in at least one culture.

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INSIDE:
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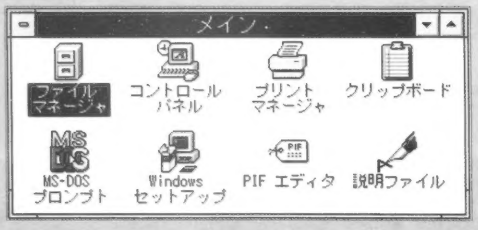
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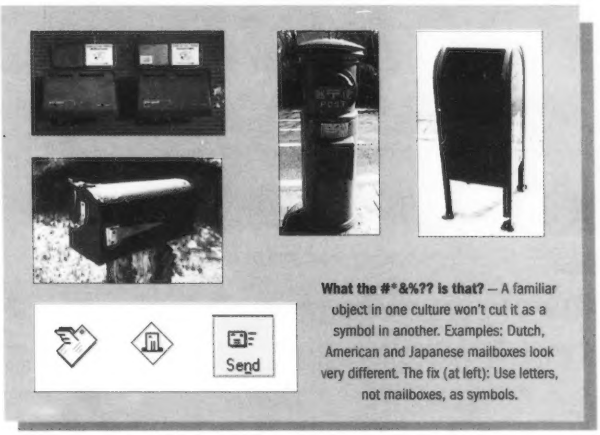
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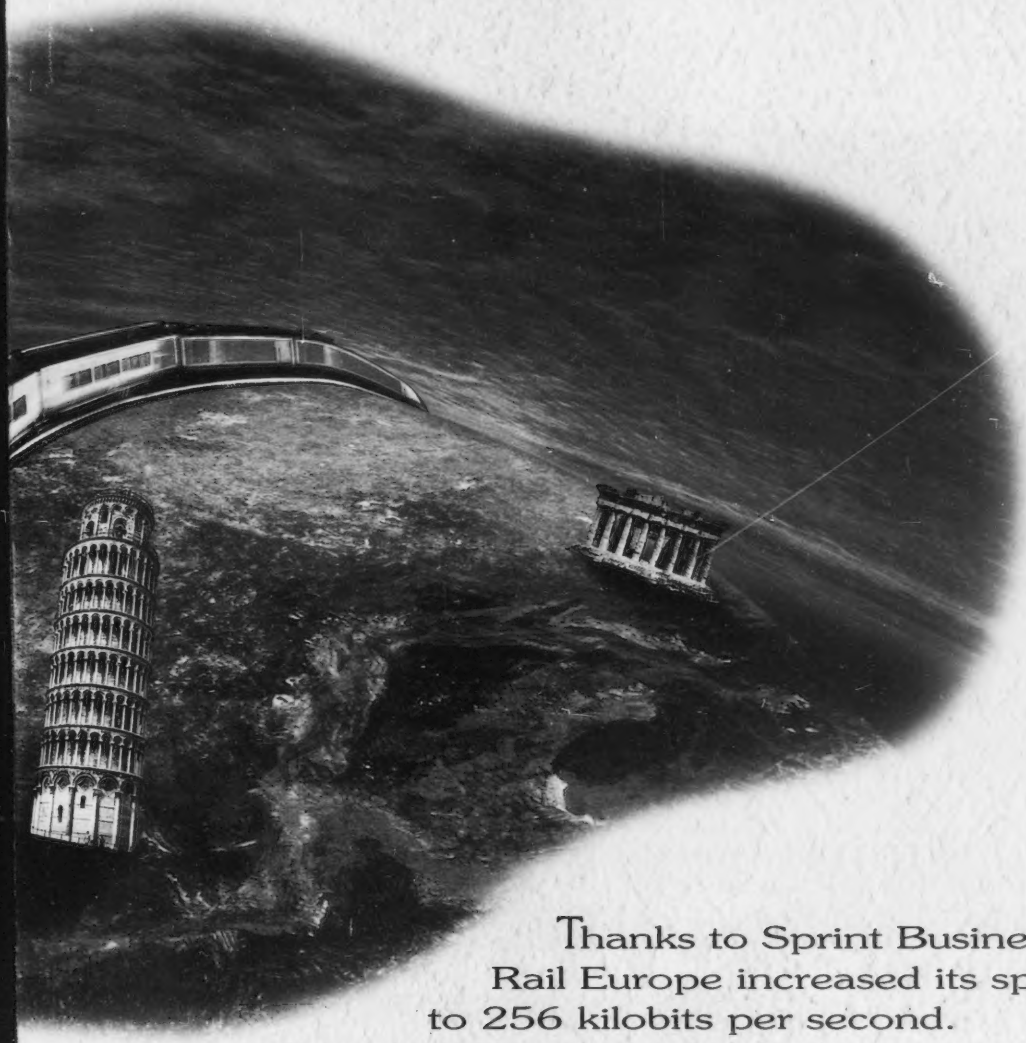
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HOT HAPPENINGS

OCT. 1 - DEC. 15

THE 1995 COMPUTER TRAINING & SUPPORT CONFERENCE

Oct. 1-4, Orlando, Fla.

IS professionals will sell their grandmas for good training — and this is the place for trainers and their managers to sort out the latest trends and techniques. There are more than 165 sessions to help you get real value from a training program and tips on selling it to top brass.

Focus: Training that packs a punch, attention grabbers, unusual and fun techniques that work, interactive multimedia and measuring the payoff.

Good for: IS professionals who provide training, support and documentation.

Speakers: Keynote speaker is Elliot Masie, president of the Masie Center and author of *The Computer Training Handbook*.

Fees: $895 for the conference; $195 for preconference seminars; and $695 for postconference seminars.

Contact: SoftBank Institute, Medford, Mass. (617) 393-3344.

SOFTWARE DEVELOPMENT '95

Oct. 2-6, Washington

Tools, tools and more tools. This must-attend event for the latest development tool technologies includes a first look at more than 30 Microsoft Corp. Windows 95 offerings. With two conferences in one — Software Development and Managing Software Development — attendees can pick from more than 150 sessions in 15 technical tracks.

Focus: The latest word on C++ programming, Windows 95 and Windows NT development, object-oriented technology, open and distributed systems and user interface design.

Good for: Managers, software developers and development team leaders.

Speakers: Jim McCarthy, director of the C++ Product Unit at Microsoft.

Fees: $995 for each conference; $1,295 for both.

Contact: Software Development Conference and Show Group, San Francisco, Calif. (214) 245-8874.

GARTNER GROUP SYMPOSIUM 1995 AND IT XPO

Oct. 9-13, Lake Buena Vista, Fla.

Here's a good chance to get a wide-angle view of the information technology industry and IS strategies, with all subjects under the sun covered. It's basically an all-Gartner affair, and the sessions are geared toward predicting the future. Depending on the speaker, you can get into heavy speculation.

Focus: All technologies considered, plus information highway and supply-chain strategies and best practices in asset management, procurement and more.

Good for: Chief information officers, IS planners and anyone needing a comprehensive, high-level look at corporate technology trends.

Speakers: Gartner consultants, plus guest appearances by Microsoft Chief Executive Officer Bill Gates, Compaq Computer Corp. CEO Eckhard Pfeiffer, Novell, Inc. CEO Robert Frankenberg and other industry CEOs.

Fees: $1,495 for Gartner Group clients; $1,995 for nonclients.

Contact: Ashley Pearce, Gartner Group, Inc., Stamford, Conn. (800) 778-1997.

CIO PERSPECTIVES

Oct. 15-18, Orlando, Fla.

We're talking posh — what other IS event has its own tennis professional? IS executives enjoy the pampering and networking and like the high-level looks at big ideas and the CIO-level case studies. It's not for those seeking hard-nosed technical insights. Sponsored by *CIO Magazine*.

Focus: A psychological take on IS-related people issues. Sessions on leadership, personality testing, learning organizations and virtual enterprises.

Good for: Chief information officers and senior IS managers focusing on human resource issues and new management trends.

Speakers: Peter Senge, author of *The Fifth Discipline*; CIOs from Allstate Insurance Co., Gillette Co., Saturn and Lockheed Martin Missile and Space.

Fees: $1,395 for IS practitioners/executives; $1,695 (including hotel) for government/military; and $5,000 for sales/marketing/consulting.

Contact: CIO Communications, Inc., Framingham, Mass. (800) 366-0246.

THE SIM INTERCHANGE '95

Oct. 22-25, Orlando, Fla.

The Society for Information Management (SIM) is bringing its annual high-level conference closer to earth. The conference's four tracks include reports from working groups of SIM members. A nice addition is the CIO Portfolio, where attendees can do personal and professional assessment with other CIOs.

Focus: Learn from your peers at tracks on re-engineering, IS management practices, linking business with technology and future technology trends.

Good for: IS executives; SIM also hopes to attract up-and-comers in mid-level IS ranks.

Speakers: Surprisingly, most keynote speakers are executives at vendors such as Lotus Development Corp., IBM and McCaw Cellular Communications, Inc. Harvard University IS guru Warren McFarland will also speak.

Fees: Free to $1,185 for members; $1,395 for nonmembers.

Contact: SIM, Chicago, Ill. (312) 644-6610.

COMDEX/FALL '95

Nov. 13-17, Las Vegas

The cab lines are awful, and it's tough on the feet. But Comdex remains *the* giant show for PC software, hardware and connectivity tools. As clients gain in importance, this has become perhaps the single most important technology show for enterprise IS managers.

Focus: Millions of products, plus sessions on the full range of desktop technologies, distributed computing and the Internet.

Good for: IS managers and professionals at all levels.

Speakers: Keynote speakers are IBM CEO Lou Gerstner, Microsoft CEO Bill Gates and Novell CEO Robert Frankenberg.

Fees: $450 for one-day conference; $595 for two days; and $695 for full package.

Contact: SoftBank Comdex, Inc., Needham, Mass. (617) 449-6600.

Hot happenings, *page 118*

HOT HAPPENINGS

CONTINUED FROM PAGE 117

DB EXPO

Dec. 4-8, New York

One of the most useful general database conferences of the year. It includes an exhibition floor awash with small and large vendors. It usually offers several seminars and presentations by IS professionals.

Focus: Outlining the newest advances in commercial database technology, including relational, distributed and object-oriented products; exploring trouble spots in implementing the products, particularly in client/server scenarios.

Good for: Database administrators, client/server project leaders, application developers.

Speakers: Keynote addresses by Colin White, president of DataBase Associates International; Kevin McGilloway, CIO of Lehman Brothers; and Andrew Filipowski, president and CIO of Platinum Technologies, Inc.

Fees: $1,495 before Oct. 20; $1,595 after Oct. 20; and $1,695 on-site.

Contact: Blenheim NDN, Inc., Mountain View, Calif. (800) 232-3976.

DATABASE & CLIENT/SERVER WORLD

Dec. 7-9, Chicago

This decidedly technical conference offers plenty of nitty-gritty seminars on developing, deploying and managing distributed computing environments. The exhibition attracts top application tools, packages and systems management vendors that show off new releases and let attendees test-drive their wares.

Focus: Client/server development and systems management.

Good for: Corporate developers, project managers, systems analysts, database and network administrators.

Speakers: Keynote addresses by John Donovan, chairman of Cambridge Technology Group; Max Hopper, former president of the AMR Corp.'s The Sabre Group; Raymond Lane, president of worldwide operations at Oracle Corp.; and Dave Duffield, president of PeopleSoft, Inc.

Fees: $995 for regular conference; up to $1,595 for preconference and postconference packages.

Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

PROJECT WORLD '95

Dec. 11-15, Santa Clara, Calif.

If it's true that most IS projects derail, then this is the premier conference to get help staying on track. The emphasis here is on lessons to help make your IS project successful. Attendees will find plenty of good sessions among the 100-plus offerings.

Focus: Choosing project management methods that work, beating the odds for success, advanced planning, risk assessment and establishing a winning culture to make it work.

Good for: IS managers or team leaders preparing to implement an IS project.

Speakers: Four keynote speakers, plus dozens of session speakers who will talk about life in the project trenches.

Fees: $695 for the two-day preconference workshops (Dec. 11-12); $995 for the three-day conference (Dec. 13-15); and $1,495 for the five-day program.

Contact: Donald M. Bible, Conference Director, Project World, Sunnyvale, Calif. (408) 739-4020.

Commentary

Richard Koeller

Simple can be stupid

What do you do when a non-information systems executive tells you: "All you need is a PC, a LAN and a $5,000 software package, and you can kiss your big IS bill good-bye forever"?

When I was an IS executive at Whirlpool Corp. and TRW, Inc., I found it difficult to deal with that kind of statement. I'd either get very technical or appear dogmatic or dictatorial. I was caught in the simplicity trap.

When it comes to technology, both IS and non-IS managers hear the virtues of simple explanations and solutions time and time again. Simplicity can be a wonderful thing, but it has its limits.

Simple solutions can be costly illusions. Users often believe information technology problems can be handled quickly and cheaply. IS can also oversimplify these issues. Too often, IS managers think a good architecture is the answer to any question.

Simple answers can also backfire on IS. IS managers regularly hear complaints that IS people have no sense of urgency and that projects cost too much and take too long. Responding with simple, defensive answers only alienates customers and kills trust.

I often had to intervene when users and IS staff posed conflicting, oversimplified alternatives. Whatever choice I made, someone was unhappy. My staff also resented the false starts and long hours caused by my proposed resolutions.

After many failed mediation attempts, I started challenging the parties to be more specific. I encountered resistance from time-pressed managers. But I persisted, and the process took hold with my staff. In time, my staff and customers saw that we were oversimplifying many issues, not just a few thorny ones. Even our IS guidelines were oversimplifications.



When IS and users battle over simplistic solutions, there's only one way out — go deeper. The trick is getting everyone to appreciate complexity.

Part of the prblem

We had always made exceptions to the rule when a guideline didn't match reality. But now we saw those exceptions were signs that we had oversimplified problems.

That insight launched a better way to deal with complex issues with customers: Whenever someone questioned our IS services, costs or practices, I asked if there was a need for an exception to the rule.

Examples of this were the skirmishes that broke out at TRW and Whirlpool when users wanted to buy their own hardware and software. IS managers wanted to maintain control over acquisition and installation; users wanted autonomy. My managers were afraid that users would inevitably get into trouble and IS would have to bail them out.

When I suggested finding an exception to our rules, my staff came up with a plan that satisfied everyone: Users were free to install technology and software that was truly local. But they had to tell IS what they were doing, so that we could warn and help them if it affected other employees.

This questioning took time, but we uncovered important hidden issues. For example, one was the "as we all know" issue. William F. Buckley once called them "the most powerful four words in the English language." Once you utter them, you can say anything and no one can challenge you. As we examined our built-in technical biases, we found we were frequently guilty of as-we-all-know-ism. Once we said those words, anything afterward was considered a management dictate.

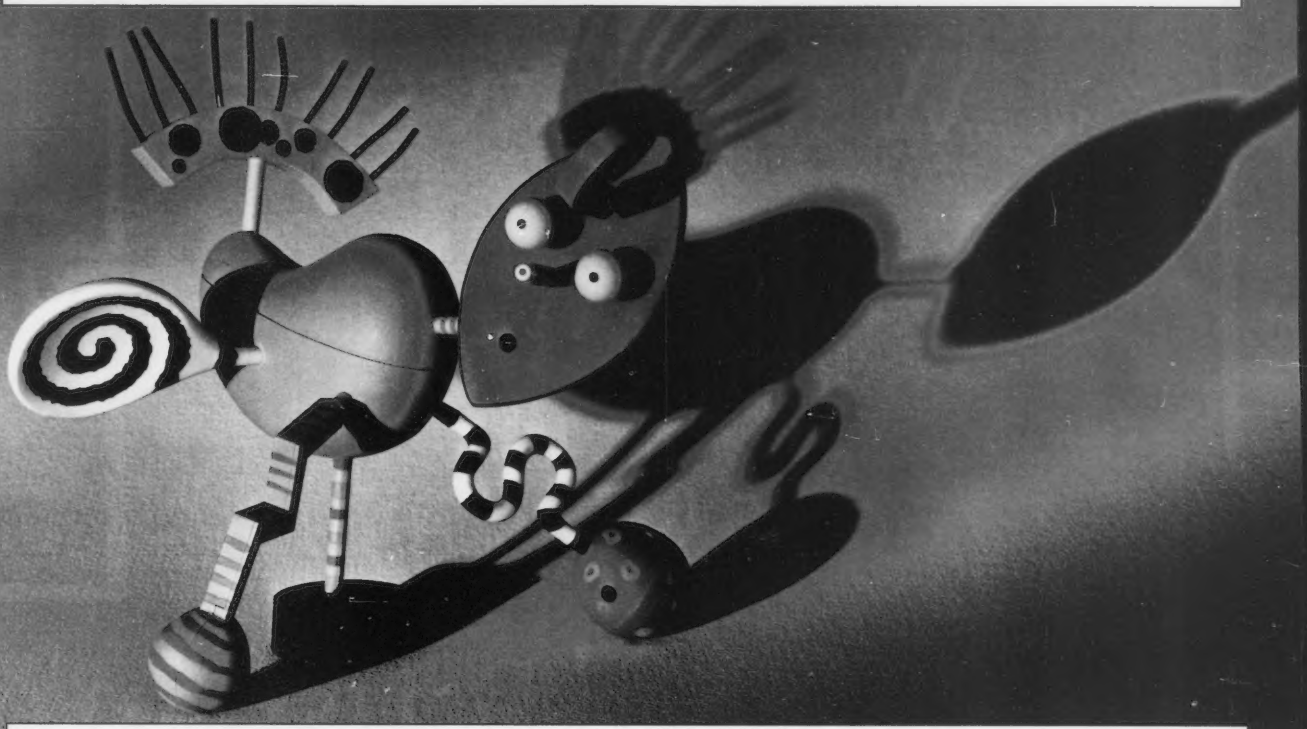
Ultimately, communication between IS and users improved, and we all did a better job defining issues, learning from one another and making decisions. However, my staff was somewhat dismayed to discover our customers could do some applications better. On the other hand, customers found that accessing and sharing data wasn't as easy as they assumed it would be.

It took time, but both my staff and internal customers accepted that some things just aren't simple. Only by dealing with their complexity can lasting solutions be found. ■

Koeller is president of Koeller & Associates, an IS management consultancy in Chicago.

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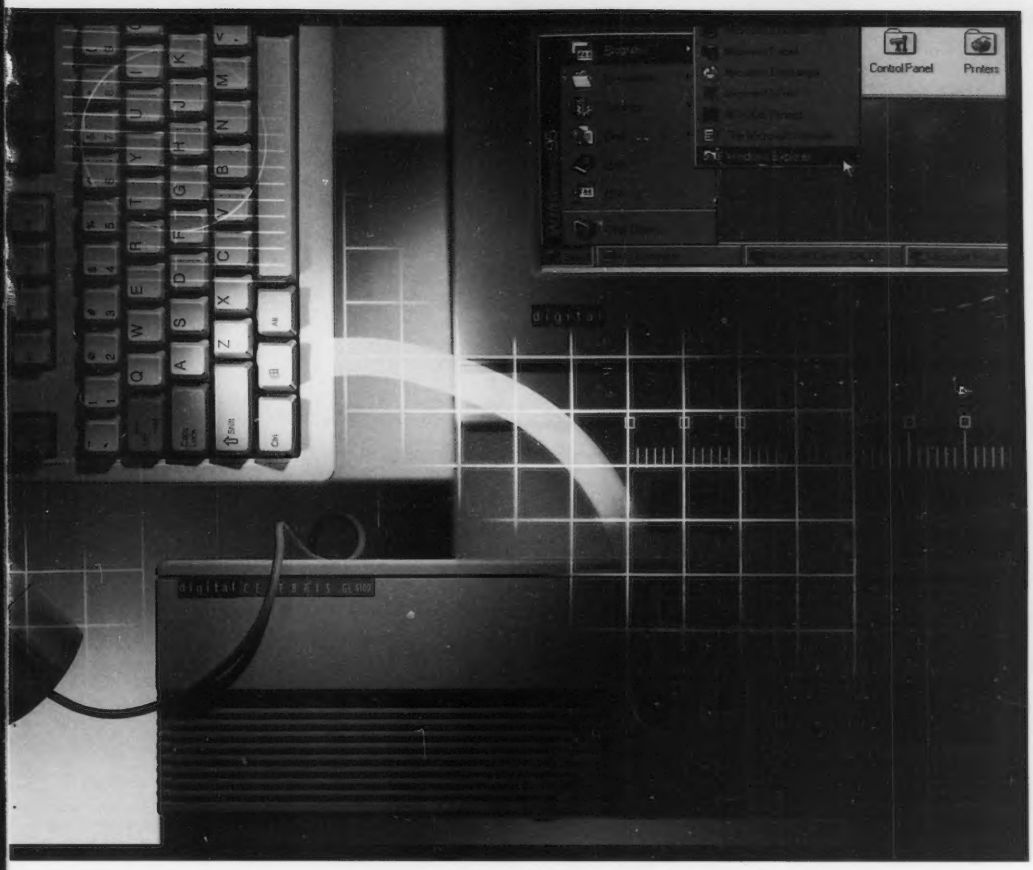
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The CW Guide to ATM

IS IT Soup Yet?



Hungry users salivate for ATM, but it still poses problems: high prices, missing standards and weak network management features

BY LYNDA RADOSEVICH

When the first products hit the market four years ago, experts said Asynchronous Transfer Mode (ATM) still needed to simmer. Guess what? They're still saying that.

High prices, missing standards, interoperability problems and the lack of network management features continue to dog the fledgling, highly anticipated network technology long after the first adapters rolled off production lines. This means that ATM's promise of universal networking is still just a promise.

"I think we haven't fully baked ATM yet, so I wouldn't recommend an end-to-end ATM solution at this point," says Mary Spada, principal at Global Growth Strategies, a Silver Spring, Md., consulting company. Now many experts won't go on the record with predictions of when end-to-end ATM networks will be real. One analysis firm, Forrester Research, Inc. in Cambridge, Mass., polled 50 user companies and found that 37 are interested in ATM, but it will be 1998 before 60% of the users at those companies have ATM access.

Who's using it?

Yet ATM isn't just tomorrow's technology. Corporations, government departments and universities are finding ATM vital for supporting very focused, high-bandwidth applications that would demolish other networks. Video, imaging and high-performance computing are some typical uses.

Oil companies use ATM to support seismographic mapping operations, automotive companies use it for design, and hospitals use it to deliver digital X-ray images, according to Fred McClimans, principal at Decisis, Inc., a consulting firm in Herndon, Va. "Generally, they are relatively small workgroup environments that have some bandwidth requirement well above and beyond the capability of most traditional networking technologies," he says.

Wall Street brokerage firm Donaldson, Lufkin & Jenrette Securities Corp., for instance, is using ATM in a LAN segment that supports 30 traders. Last year, the firm upgraded the network from Fiber Distributed Data Interface, which is a 100M bit/sec. shared medium network technology, to ATM because increased automation in the trading software was degrading network performance, and traders can't tolerate delays.

Now the network can handle dedicated connections of 155M bit/sec. and the trading application runs roughly three times faster than before. The firm isn't transporting anything fancy — no video or large images. "We're just transferring mass quantities of data all over the place," says Scott Knipfing, a vice president at the firm.

Although its current role is limited, ATM has retained its place as networking's panacea for end-to-end networking because it promises to support 21st-century multimedia applications that already are sprouting.

ATM works by taking all types of network traffic — data, voice, vid-

Is it soup yet?, *page 124*

Inside

▶ **For more on ATM.** See the following:

Your ATM adviser, page 126.

The hunt for ATM hardware, page 130.

IS IT Soup Yet?

CONTINUED FROM PAGE 123

eo and television signals — and cutting them into 53-byte cells or packets. The traffic can travel over private or public networks directed by switches. The switches can send traffic down any of several physical paths, a capability that increases transfer speeds. However, the link appears to be a dedicated, point-to-point connection known as a virtual circuit to the end user. The switched nature means users don't have to pay for dedicated lines that may often sit idle. Rather, bandwidth is available on demand. Also, the fixed-length packet allows vendors to build very fast switches, and the small packet size ensures that voice and video frames can be inserted into the stream often enough for real-time transmission.

For the industry to achieve these goals, a rash of maturity issues must be solved.

One monster problem is poor interoperability among vendors' ATM switches. ATM standards require flow control, which prevents network congestion by limiting the amount of traffic that goes into a particular switch. But one vendor may decide to control flow by discarding cells if a line gets overloaded. Another may decide to buffer those cells. A third may decide to send a message back to the source of the traffic to tell it to slow down. Thus, flow control doesn't work between the various products; the network clogs, and all hell breaks loose as throughput drops to zero.

Interoperability problems

Northeast Utilities Systems in Berlin, Conn., is one of the rare birds that has committed to deploying ATM from the desktop to wide-area networks by the end of next year, but interoperability issues are a stumbling block. "Since we're a multivendor shop, we need all the vendors [products] to work together to make it happen. And that's been a *little* more difficult than I would have liked," jokes information systems manager Rich Kubica. Kubica offers this piece of advice: "Stay with one vendor, if you can."

Doing that isn't easy, however. Most name-brand network vendors don't yet have a full line of proven ATM products. Smaller players such as Fore Systems, Inc. and Newbridge Networks Corp. may have such a range of products. But in real life, single-vendor networks just aren't realistic. For that reason, current and future ATM vendors have recognized the flow control problem and promised to work on interoperability via the The ATM Forum, a powerful trade group.

Meanwhile, users have a couple of options for handling multivendor ATM networks. Northeast Utilities is working with its specific vendors on building compatibility between products. Amoco Corp., which is a pioneering ATM user site, deliberately underbooks the network and uses devices that have large buffers, says telecommunications analyst David Beering. "Buffering gives you the elasticity you need in the network, and underbooking ensures that you don't have cells lost," he says.

LAN emulation is another problem. Although The ATM Forum this year defined a standard for how applications can run across ATM and traditional networks, the standard is already under revision. Those who bought products that aren't upgradable to the standard are out of luck. To avoid this, "you have to future-proof your purchases by making sure they are upgradable. If they are not, wait for the new products that comply with the new standards," says Spada, who also chairs The ATM Forum's User Business Requirements committee.

Of course, price is an issue. Costs have dropped in the past four years, but at $1,000 to $5,000 per port for an adapter card and a switch connection, ATM still is at least twice as expensive as switched Ethernet, which is popular for its ability to squeeze more bandwidth out of traditional Ethernets. Other costs include upgrading workstations to handle ATM and retraining staff in the peculiarities of the new technology.

The high price means IS managers can expect to cost-justify an ATM investment based on specific business goals or objectives (see "Does it make dollars and sense?," page 126). For example, Donaldson, Lufkin & Jenrette was able to cost-justify ATM because the faster network led to reduced business overhead, Knipfing says. The brokerage must pay a "daylight overdraft" fee to the Federal Reserve System for the negative balance it carries between the time it buys U.S. Treasury bonds and the point at which it sells or lends them. To reduce that fee, the firm must move bonds quickly and complete a collateral exchange. The ATM network and automated trading software speed transactions enough to save the firm $750,000 in daylight overdraft fees in one year, Knipfing says.

While ATM exists mainly in small islands for now, many users are thinking about broader implementations in the next year or two.

For instance, ATM is expected to become more of a backbone technology in the next year as vendors such as Cisco Systems, Inc., Cabletron Systems, Inc. and 3Com Corp. bring full ATM lines to market. And it should grow in popularity as long-distance vendors follow through on announcements to offer ATM services for T3 and T1 links.

To prepare for that future, users can start by upgrading their network's physical infrastructure.

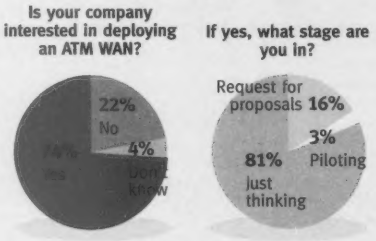
Meanwhile, users can take heart from the impressive gains that already have been made. "A year and a half ago, users with Category 3 [twisted-pair copper cabling] in their desktop environment thought, 'I'll never be able to have ATM unless I swap out my desktop environment,'" says Beering, who also is chairman of The ATM Forum's Enterprise Network Roundtable Committee. That has changed already.

Advocates say this is a good time for users to think about how to start implementing ATM and begin evaluating switches, but they must be realistic about the current limitations. "My recommendation is to start working with the technology now, and my warning is not to underestimate the complexity of ATM," Beering says. ■

Radosevich is a freelance writer in Belmont, Mass.

SOMETHING TO THINK ABOUT

In a survey of 50 Fortune 1,000 companies, roughly three quarters said they are interested in deploying an ATM wide-area network (WAN), but few have the technology in place



PERCENTAGE OF COMPANIES INTERVIEWED

Source: Forrester Research, Inc., Cambridge, Mass.

In the field

***Computerworld* hired First Market Research Corp. to poll 10 organizations that have already made the ATM leap. The following are general findings from those interviews.**

What do users pay the most attention to?

Out of 20 categories, the following 10 topped the list as the most important:

- Integration with existing LANs.
- Interoperability with routers.
- Software reliability.
- Performance of direct LAN connections.
- Performance of network management features.
- Service and support quality.
- ATM hardware reliability.
- Value.
- Flow control.
- Service responsiveness.

Users also graded their satisfaction with their ATM switch's performance. Some of the more interesting points were the following:

Cisco Systems, Inc.'s Lightstream 2020

One Cisco user marked "average" in every category but one. He gave the switch's routing ability a "very good."

He said, "I've seen others that are a little cheaper and faster."

Digital Equipment Corp.'s Gigaswitch

One Digital user evenly split his grades for the 20 categories between average and good.

But he noted that when he needed help, "Digital was right there for us; the initial configuration was too involved for us."

Newbridge Networks Corp.'s Vivid Yellow Ridge

The Newbridge user contacted gave mostly average scores with the most notable exception being value.

He said, "Its price/performance is better than average."

SynOptics Communications, Inc.'s Lattis System 5000

Two users who consider permanent virtual circuits crucial gave Lattis System 5000 a "very good" for its support.

But one user couldn't help but add, "We bought SynOptics because it was at the forefront, but now other vendors have passed them with better products and services."



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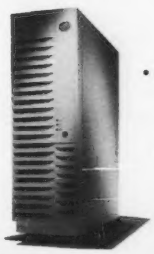
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Your ATM Adviser

A compendium of frequently asked questions regarding ATM

ATM, now or later?

Even vendors say it would be foolish for most users to move to a wholesale ATM architecture and replace their existing technology.

"The only case where it would be a reasonable strategy to deploy a Level 3 ATM [switched] architecture instead of routers would be if a user had nothing deployed to date, and who can say that?" asks consultant Tom Nolle, president of CIMI Corp. in Voorhees, N.J.

To help make such decisions, analysts suggest users first determine how far away ATM is for their organizations and employ the following general guidelines:

- If it's within four years, be cautious about buying any ATM technology. Make sure it supports all ATM standards and hold off from making any router purchases.
- If you are confident ATM is more than four years away, it is premature to consider a switched alternative to routing because you won't have a clear idea of the features you'll need.
- If your organization plans to use ATM at any point in time, make sure that any LAN switch you buy today has ATM capabilities built in, such as an ATM trunking capability that allows switches to be connected to one another with ATM.
- How long do you need to keep that new switch or router in the network? If the answer is more than five years, then plan for it to exist in the ATM future.

— Compiled by Stephen P. Klett Jr., a freelance writer in Foster City, Calif.

Where do I go from here?

Tips for ATM product evaluation

By David F. Hold

Your boss has sent you a memo stating that the company needs an ATM transition plan. You are instructed to evaluate all available ATM products. You respond with the usual arguments: ATM is immature; the standards are in flux; prices are too high — but it is to no avail. Your boss, who reviewed numbers on how ATM blows away the competition when it comes down to dollars spent per megabit sent, wants the report right away.

Here are a few guidelines to follow.

First, thoroughly analyze critical business requirements to understand how ATM can be most effectively deployed. This can be used to generate a list of "must have" criteria to narrow the field of prospective vendors.

A request for information (RFI) should be prepared. The first set of questions should focus on the vendor. Did the company develop its ATM technology through research and development, through an acquisition or through an OEM arrangement? If the vendor hasn't developed its own ATM products, how much does it really know about ATM?

One test of a vendor's expertise is membership in The ATM Forum. Only principal members have voting privileges on the committees. Find out whether the vendor participates on technical committees. Some companies play a critical role in the development of The ATM Forum's specifications, which gives them an edge in product development.

As a prospective user of ATM products, it is important to understand the issues facing the Forum. For example, when the Forum finalizes the available bit rate specification, current generations of network interface cards and some ATM switches may become obsolete. Knowing how the vendors plan to comply with future standards can protect your investment.

The next set of questions should focus on hardware, including switches, adapters and software. Several sample questions appear below. These items come from a 100-question "Mock ATM RFI" developed by the Enterprise Networking Roundtable Committee.

HARDWARE

1. What is the rated capacity of the switch, and how is it determined?
2. What is the switch transit delay?
3. What is the cell buffer capacity, and where are the buffers located?

SOFTWARE

1. How many quality-of-service parameters and classes of service are supported?
2. Does the switch support switched virtual circuits?
3. How many virtual channels and paths are supported?
4. Are circuits automatically reestablished following a link failure?

Every question should elicit several follow-up questions. While most are truthful when responding to an RFI, some will give misleading answers.

A bank executive once asked a vendor how many virtual channels its switch could support. Its answer: 64,000. It was later discovered that the switch could only support 500 virtual channels; the customer could choose any number from one to 64,000, but only 500 could be used. The truth was discovered when examining buffer capacity, which revealed there wasn't enough memory for that many virtual channels.

The lesson here is that buyers must be aware and knowledgeable.



Hold is editor of "The ATM Report," a newsletter produced by the Broadband Publishing Corp. in Rockville, Md. He can be contacted through CompuServe at 74551,1064@compuserve.com. The ATM Forum can be contacted by Internet at info@atmforum.com.

Does it make dollars and sense?

Consultant Mary Spada gives six principal steps users should follow to determine whether ATM costs are worthwhile. Spada, principal at Global Growth Strategies, advises the following:

1) Identify business goals or objectives, such as increased customer satisfaction or improved competitive position, that an investment in ATM will achieve or facilitate.

2) Determine the means by which the proposed investment will achieve those goals.

3) Determine whether and to what extent the user enterprise must redesign or re-engineer its business process.

4) Estimate the contribution of the proposed ATM investment and related process redesign to the business value of the enterprise.

5) Calculate the direct, indirect and contingent costs of the proposed investment, including related process redesign.

6) Decide whether to recommend or reject the proposed investment.

"If you do a value-based justification, it is absolutely phenomenal how little you'd perceive to be spending on some of these advanced networking solutions, particularly those involving ATM," Spada says.

— Lynda Radosevich

Info please

For more on ATM, check out the following World Wide Web sites:

▶ http://www.atmforum.com
The ATM Forum Web site

▶ http://www.atm25.com/ATM_Reference.html
Links to dozens of ATM reference sites on the Internet and Web

▶ http://snmp.cs.utwente.nl:1080/ietf.html
ATM-related activities of the Internet Engineering Task Force

▶ http://aiolos.ntua.gr/atm-root.html
Links to other ATM sites on the Web

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THE Hunt for ATM HARDWARE

BY KEVIN TOLLY

Given the near frenzy surrounding Asynchronous Transfer Mode (ATM), it's no surprise that network managers are anxious to get their hands on some gear to see for themselves what the technology can do for their organizations.

Yet getting that equipment is easier said than done. Hype and trade show demonstrations notwithstanding, there is far less usable product available than the casual observer might imagine. The shortage is particularly noticeable when it comes to the hardware and software required for corporate environments.

Most vendors ship ATM adapters for Sun Microsystems, Inc.'s SPARCstations and drivers for Unix, but few ship adapters and drivers for common corporate operating systems. Several vendors contacted said they weren't yet shipping their first adapters and drivers for Intel Corp.-based PC systems.

For this piece, we asked vendors to send us any adapters and drivers

Hunt for ATM, *page 133*

ATM adapter card checklist

Selected ATM card products and the environments they support

VENDOR	SPEED (BIT/SEC.)	PRODUCT NAME	INTEL BUS SUPPORT	DRIVERS	SWITCH COMPATIBILITY	PRICE
Fore Systems, Inc. Warrendale, Pa. (800) 884-0040	155M 155M	ESA-200PC/OC3 PCA-200PC/OC3	EISA PCI	NetWare 3.12, 4.1 Windows NT 3.5	Fore	$1,195 $1,195
Adaptec, Inc. Milpitas, Calif. (800) 934-2766	155M	ATM155 (ANA-5940)	PCI	Win NT 3.5, 3.5.1 (Beta)	Bay, Cisco, Digital, First Virtual, Fore, IBM, Whitetree	$449
Efficient Networks, Inc. Dallas (214) 991-3887	155M 155M	ENI-155E-MF ENI-155P-MV	EISA PCI	NetWare 3.12, 4.x (Beta, PCI), Win NT 3.5 (Beta, EISA)	3Com, AT&T, Bay, Chipcom, Cisco, Digital, Fore, Hughes, IBM, Netedge, Newbridge	$1,495 $1,495
IBM Armonk, N.Y. (800) 426-3333	155M	Turboways 155	MCA	AIX	Bay, Digital, Fore, General Datacomm (PVC* only), IBM, NET (PVC* only), UB Networks	$1,995
Interphase Corp. Dallas (800) FASTNET	155M 155M	4815 EISA 5515 PCI	EISA PCI	Win NT 3.5	Agile, Bay, Chipcom, Cisco, Digital, Fore, IBM, Lightstream, NEC, Newbridge, UB Networks, Xylan	$1,395 $650
Newbridge Networks Corp. Herndon, Va. (800) 343-3600	155M	Vivid EISA NIC	EISA	NetWare 3.11, 4.0, Packet drivers for Windows 3.x, HP-UX, IRIX	Newbridge	$1,995
Olicom USA, Inc. Plano, Texas (800) 265-4266	155M	OC-6132 ATM155	EISA	Win NT (Alpha), Windows for Workgroups, NetWare	Bay, Centillion, Cisco, Fore, Newbridge	$1.995
Trancell Systems Santa Clara, Calif. (408) 988-5353	155M	PCI-155 ATM Adapter	PCI	Windows	Fore, NEC, SynOptics	$995
ZeitNet, Inc. Santa Clara, Calif. (408) 986-9100	155M	ZN1221	PCI	Win NT 3.1, 3.5 (Beta)	Bay, Chipcom, Cisco, Digital, Fore, General Datacomm, Hughes, IBM, NEC, UB Networks	$1,095
Adaptec Milpitas, Calif. (800) 934-2766	25M	ATM25 (ANA-591)	PCI	Win NT 3.5, 3.5.1 (Beta)	Bay, Cisco, Digital, First Virtual, Fore, IBM, Whitetree	$449
First Virtual Santa Clara, Calif. (408) 988-7070	25M	Media Adapter	ISA	Windows, Windows for Workgroups, NetWare 3.x, 4.x, Microsoft LAN Manager	First Virtual	$550
IBM Armonk, N.Y. (800) 426-3333	25M	Turboways 25	ISA	Windows, Windows for Workgroups, NetWare 3.x	Bay, IBM, NEC	$405

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THE Hunt for ATM HARDWARE

CONTINUED FROM PAGE 130

they said were shipping. Thus, this data is based on products whose existence The Tolly Group has verified rather than those whose existence is merely a vendor claim. For switches, which are much pricier than adapter cards, we relied on vendor information.

Pick a speed

The most basic division in campus ATM is between 155M bit/sec. and 25M bit/sec. varieties. The former is the preferred high-speed technology that uses fiber-optic connections to carry traffic from high-powered workstations and servers to switches and also serves as a switch-to-switch transport. A 100M bit/sec. ATM standard known as Taxi also exists, but interest in this speed is lagging far behind the 155M bit/sec. variety. The 25M bit/sec. technology, usually called desktop ATM, is a rapidly growing entry.

While 155M bit/sec. technology is aimed at power users, desktop ATM targets every user. The idea behind desktop ATM is to make ATM the logical next step for even the most humble Ethernet and Token Ring users. The technology runs over existing copper cable and is available even for Industry Standard Architecture (ISA) computers — meaning you could even plug it in to an old IBM PC AT. It is priced at about one-third the price of 155M bit/sec. fiber-based adapters. IBM is even pricing 25M bit/sec. adapters in the range of Token Ring adapters, thus cannibalizing its own Token Ring sales. While some vendors sell products of both types, it's easier to group products by speed.

Research a switch

The ATM switch is a high-powered device that shuttles ATM cells from port to port with blinding speed. Such power comes with a hefty price tag. For example, a low-end, four-slot Fore Systems, Inc. ASX-200BX outfitted with just a single module containing four fiber ports costs a little over $30,000. Copper-based desktop ATM switches, such as the one offered by Whitetree Network Technologies in Palo Alto, Calif., are much less expensive, with a 12-port model that costs approximately $7,795. Still, with standard Ethernet stackables breaking the $100-per-port barrier and with Ethernet switches and 100M bit/sec., or Fast, Ethernet hubs priced well below $500 per port, a move to either flavor of ATM represents a stiff hike in per-port costs.

It is much harder to find adapters for Intel-based machines with the appropriate software support than it is to find an ATM switch. Because of this, network managers testing ATM are better off finding an appropriate adapter provider and then determining with which switch those cards will work. Pairing switches and cards is critical because few, if any, products based on the recently architected LAN Emulation standard set are shipping.

Bus types

The first step in bringing an ATM connection to a client or workstation is verifying that a vendor offers an adapter for your bus architecture. In the Intel PC world, that could mean ISA, Extended Industry Standard Architecture (EISA), IBM's Micro Channel Architecture (MCA) or Peripheral Component Interconnect (PCI). There are a few rules of thumb you can follow here:

- Expect 155M bit/sec. adapter vendors to provide EISA adapters and, soon, PCI adapters. Adapters built for IBM's proprietary MCA bus are few and far between — especially because IBM has also embraced PCI. IBM does manufacture MCA adapters, but they are most often used in IBM's RS/6000 Unix-based systems.
- Don't expect to find 155M bit/sec. adapters for standard ISA clients. Such 155M bit/sec. adapters are appropriate only for high-powered servers. Network managers rarely build such servers on standard ISA bus machines, and the ISA bus has a limited bandwidth capacity. Expect prices for the EISA adapters to hover around $1,200 and PCI adapters to cost between $450 and $650.
- With desktop ATM, the bus focus shifts downward. Here, expect ISA adapters to be available from most, if not all, vendors and expect PCI adapters to appear from virtually every vendor. PCI combines high performance and low price, and PCI adapters will likely emerge as the standard for Intel-based systems. Vendors, including IBM, have priced the ISA ATM adapters very aggressively and in a way that could intentionally bite into sales of Token Ring products. ISA and PCI adapters will cost from $400 to $550. Vendor interest in MCA continues to wane, and so few EISA PCs were sold as desktop machines that very little market exists for 25M bit/sec. EISA.

Drivers & software standards

Even once the adapter/switch quandary is resolved, managers will run into two major hurdles: operating system drivers and LAN Emulation compatibility. Merely plugging in an ATM adapter to your PC does nothing for you. Drivers are needed for data to flow from applications to the ATM switch and beyond.

Vendors of 155M bit/sec. adapters have naturally focused on two operating environments — Novell, Inc.'s NetWare 4.x and Microsoft Corp.'s Windows NT Server 3.5. Beyond that, support is fragmented. Some vendors offer drivers for various versions of Intel-based Unix systems, such as Novell's UnixWare 1.1.

In the realm of desktop ATM, Windows is the natural focus for most vendors. Drivers for NT, Windows 3.1 and Windows for Workgroups are generally available. We'll surely see support for Microsoft's Windows 95 in the near future. To date, the only vendor we've seen offering OS/2 support is IBM. Those drivers just became available in July.

But software support for ATM goes well beyond mere interface drivers. The LAN Emulation standard was architected to enable legacy LAN applications, written to standard Network Driver Interface Specification or Open Data-Link Interface interfaces, to run transparently and dynamically on ATM networks. Unfortunately, the standards work, completed in February, is so recent that as of August, not a single vendor was shipping production versions of that code.

Without standard LAN Emulation, schemes such as Fore's Simple Protocol for ATM Network Signaling are needed to let clients establish dynamic connections to servers across ATM. ■

Tolly is president of The Tolly Group, a consulting and testing firm in Manasquan, N.J. Additional research was provided by Tolly Group staffers Caryn Hill and Andy Hacker.

Up to the minute

Summaries of recent ATM announcements:

IBM finally spelled out the specifics of its Switched Virtual Networking strategy early last month. The strategy comprises three components: periphery switching, backbone switching and Network Broadband Services. The strategy is designed to accelerate ATM adoption by eliminating stand-alone routers. Instead, the routing function will be built directly into workgroup hubs. The architecture will be implemented using IBM's Nways line of hubs, switches and bridges. *Network World, Sept. 4*

Agile Networks, Inc. in Concord, Mass., announced it is adding distributed LAN Emulation capabilities across its ATMizer line by the fourth quarter. *CW, Sept. 4*

CrossComm Corp. in Marlboro, Mass., announced it will deliver in November its ATM Edge Switch module, which lets routers link legacy LANs to ATM networks. *CW, Sept. 4*

Xylan Corp. in Calabasas, Calif., announced its OmniSwitch will support ATM switching by the second quarter of next year at 25M, 155M and 622M bit/sec. speeds. *CW, Sept. 4*

3Com Corp. said it will announce a software module that will enable users to manage its entire line of ATM products. The module is already in use at a handful of sites and could be generally available in a month. *CW, Sept. 11*

A standards agreement reached last month between **The ATM Forum** and **The Frame Relay Forum** is expected to help pave the way for users to mix frame-relay and ATM traffic on their high-speed networks. The agreement helps frame-relay users with their migration and eliminates having to make an all-or-nothing choice. *CW, Sept. 11*

Fore Systems, Inc. introduced its ForeRunner ES-3810, an Ethernet switch that it says will help users migrate gradually to ATM networks. *CW, Sept. 18*

In Depth

SoundOff!

AT ISSUE: How involved IS should be in re-engineering
Others say that IS should take the reins of projects or,

What is IS' role in

Business leaders should lead

By Scott E. Bates

The only way a re-engineering effort will succeed is if business leaders lead. Don't get me wrong. Information systems professionals are critical to the success of any major reform effort, but if business leaders aren't behind change, it won't happen. That's because real change is about more than just modifying a process. It's about changing behaviors.

Hear me out.

New technologies such as imaging, document management software and groupware can dramatically improve dramatically the way we deliver our company to customers. These new technologies enable us to be much more customer-focused. They enable us to work efficiently in cross-functional teams with people from all over the world. And they provide a means to learn from one another's experiences.

These three organizational attributes — customer focus, teamwork and organizational learning — are the keys to competitive differentiation in our industry. Unfortunately, these attributes are hard to achieve. They occur only in highly deveioped cultures. And culture is the business leader's job.

An IS staff can implement the most marvelous groupware system. But what if no one turns it on? Putting a technical solution in place doesn't guarantee people will use it.

This points out one of the business leader's essential roles: to lead by example. Our IS professionals have a responsibility to understand the business and stay abreast of relevant, new technologies. But they simply aren't in a position to effect change through their own example.

In the past, for instance, we had trouble transmitting accurate information about a sale from our salespeople to the production areas in our cash management department. Taking information over the telephone caused errors. Then we changed the process — IS developed electronic "new business" forms that our salespeople could fill in and transmit directly to the appropriate unit. Perfect, right?

Wrong. Few salespeople used the electronic form, despite heroic efforts by our IS people to make it understandable and easy to use.

Business managers explained to the sales force that using the electronic form was optional but that it would be the only source by which they could get credit for the new business they sold. New business sold, of course, is tied to their compensation. "Optional" here stands for "if you want to get paid, use the electronic form."

That kind of business mandate can come only from a business leader. And it again demonstrates the need to integrate technology into regular business processes to ensure its use.

Technology should be viewed as an important *component* of any business initiative. Business initiatives, not systems initiatives, must be the priority. Otherwise, business managers are placed in a double jeopardy situation in which business initiatives and systems components are evaluated and approved separately.



SANDRA HELLER

'IS professionals ... simply aren't in a position to effect change through their own example.'

SCOTT BATES, senior vice president, First National Bank of Chicago, functional head of its Customer First transformation effort

While it is the responsibility of IS professionals to articulate a systems vision for the firm, that vision needs to be framed in the context of a vision for the business. Only business leaders are in a position to articulate such a vision and choose investment priorities that will affect the vitality and longevity of the company. This includes the priority given to re-engineering initiatives.

It's tempting to get caught up in the "toys" associated with change — laptop computers, access-to-remote databases, software that slices and dices in the customer's office. These "enablers" are effective only when the culture is right, when people are focused on the customer, motivated to work in teams in a collaborative way and eager to learn from one another.

Culture is a leader's job. Leadership is leadership. It's rare enough that we should latch on to it whenever it appears. But at the end of the day, accountability for business leadership rests with business managers. ■

is up for debate. Some would argue that only business leaders can head up change. at the very least, be viewed as equals.

re-engineering?

IS pros should be treated as equals

By Jodie Ray

Information systems people aren't re-engineering wreckers; we at Texas Instruments, Inc. certainly aren't. Re-engineering isn't a threat to IS professionals. It's an opportunity for them to contribute to business success. IS professionals are instrumental to re-engineering projects at TI and at most enlightened companies.

We have successfully completed more than 35 re-engineering projects in the past five years. Business process engineering professionals from our central IS organization have facilitated the majority of these projects. Successful re-engineering efforts require a partnership between business and IS professionals.

In one of our re-engineering projects involving the semiconductor business, for example, we formed a re-engineering team composed of business and IS professionals. We just couldn't have made the gains we did if these groups hadn't worked in concert.

The chip business was under a lot of pressure. It wasn't enough anymore to compete on cost, functionality or quality. Our customers wanted to reduce product delivery cycle time; that is, they wanted us to cut the amount of time it took from our first design release to our first production product delivered to them.

Our re-engineering team developed a map of the business processes involved and the information systems that supported those processes. The redesigned process and revamped systems helped reduce product delivery cycle time by 70%, increased annual profits by several hundred million dollars and achieved a gain in worldwide manufacturing capacity equivalent to the capacity of a new $500 million chip manufacturing facility.

We also are the No. 5 semiconductor producer in the world and gaining market share. Pretty good re-engineering effort, wouldn't you say? And by the way, the IS professional who facilitated this project now manages the TI Business Process Engineering Center of Excellence, which is part of our central IS organization.

IS people are also spearheading the re-engineering of their own shop. Our IS staff agreed with our business customers that IS wasn't up to snuff in areas such as cycle time, flexibility and cost effectiveness. Cycle time is defined as the amount of time from customer request to installation of a technology. Flexibility is the ability to modify the technology continuously based on the needs of the business. Cost-effectiveness is the benefit vs. the cost of the technology.

It was basically a case of "physician, heal thyself."

An example of IS re-engineering itself is an ongoing project to compress its provisioning process — to respond to business customers who feel that IS doesn't provide the information technology they need fast enough to stay competitive. Cycle times for providing technology have been longer than 15 months. IS wants to reduce that time to 60 days.

IS put together a team of people who support various TI businesses. Its challenge was to deliver, within six months, a process for significantly improving implementation cycle time. The team held customer interviews and focus group sessions. Members compiled a list of key attributes for the new process and reviewed various business models.

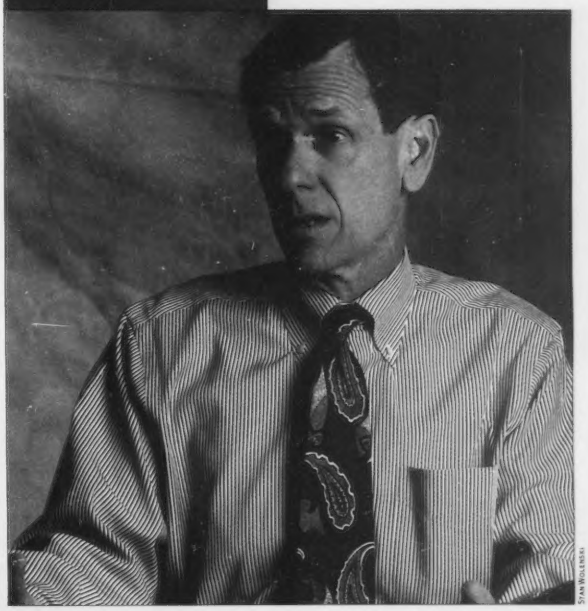
They focused on three models: one that zeroed-in on customer intimacy, one that targeted selection of the right skills and tools and one that focused on preparedness to act quickly to fulfill customer needs. Pilot projects using these models are underway and cycle times are dropping.

IS people are significant players in the re-engineering process. They can even lead the effort, as they have at TI. IS pros must work with business groups to do what's best for a company.

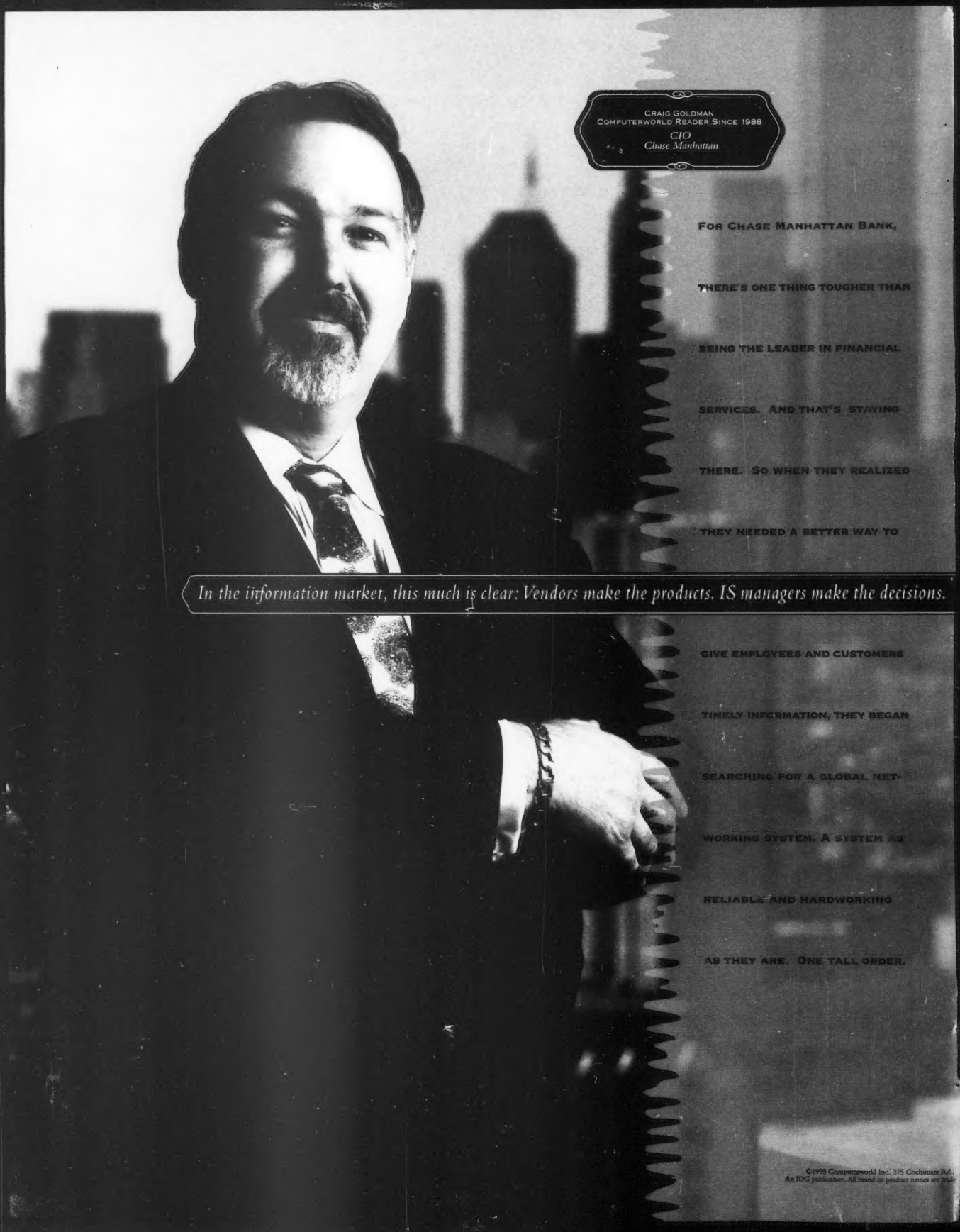
Together, they can successfully re-engineer the corporation. ■

'IS people are significant players in the re-engineering process and can even lead the effort.'

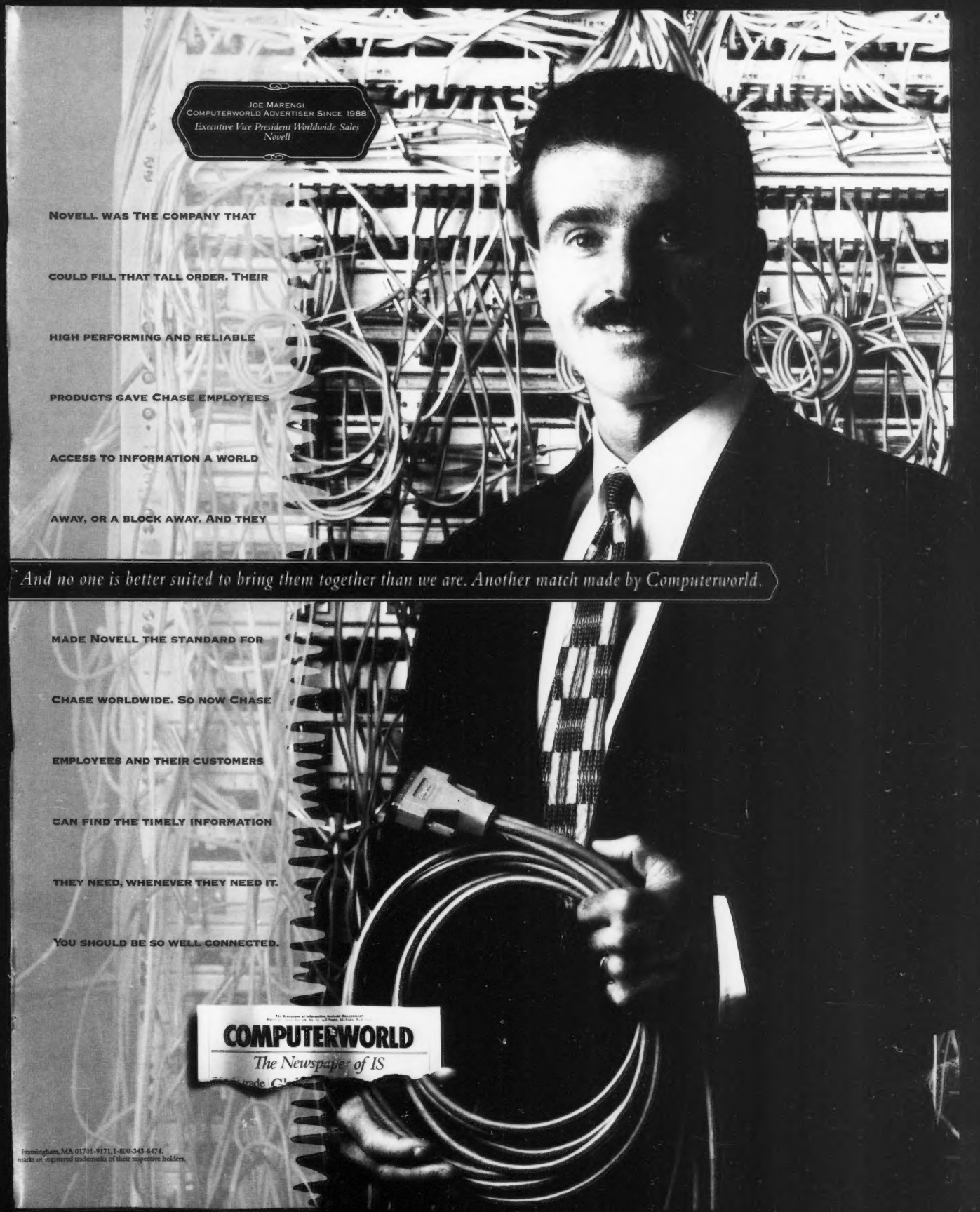
JODIE RAY, chief information officer, senior vice president, corporate staff, Texas Instruments, Inc., Plano, Texas



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Paul Gillin, Executive Editor, Computerworld
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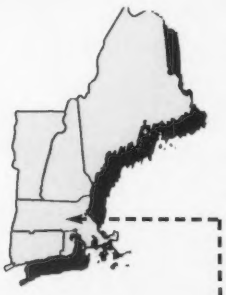


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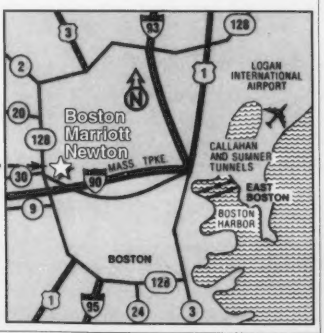


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Computer Careers

Down but not out

Two East Coast groups offer internships (and hope) to displaced IS professionals. After six months, many interns leave with new skills and full-time jobs.

By Candee Wilde

It's a catch-22: You can't get a job in a new field until you have experience, and you can't get experience until you have a job. But two organizations offer programs where unemployed computer professionals can change this age-old dilemma.

The Massachusetts Software Council's fellowship program places job-seeking computer pros in positions at about 80 software companies. Likewise, the Career Development Group (CDG) in New York finds engagements for volunteers who want to learn specific technologies.

At worst, the groups give weary job-seekers new faith in themselves. At best, they create opportunities. Their track records speak for themselves: About 85% of the fellows who complete the six-month Massachusetts program leave with jobs. CDG's results are harder to quantify, but volunteers say the experience is worth it.

> "Any time I talked about the volunteer work, people were impressed. It showed I wasn't sitting around waiting for a job to fall into my lap."
>
> — Nicholas Quane, systems operator, New York State Society of CPAs

Warren Case, 38, became one of the first fellows of the Massachusetts program. After losing his highly specialized job testing Raytheon Co.'s Patriot Missile computer systems, Case took a course in C, Unix and SQL. But hiring companies wanted more. He applied to the program in November 1993 and was hired six months later by his host company, Lightbridge, Inc. in Waltham, Mass. "I feel like I've died and gone to heaven," Case says.

While working as a fellow, Case received a stipend of about $350 a month and attended class for free. But starting Oct. 22, students will be required to pay a $3,500 tuition fee to augment state and federal funding. Still, it's a good deal when one considers the chances of coming away with a job.

The fellowship program, which has strict entrance requirements (see box at right), seeks people "willing to make the shift into a different industry and make it a career," says Mary Cahill, executive director of the program. Participants begin with a three-day retreat to learn team-building skills and follow up with a three-week introduction to the software industry.

Peter Daman understands the transition well. He was in his 50s when a two-decade career at Digital Equipment Corp. came to a premature close.

On the street, he found his knowledge of Digital's proprietary technology virtually worthless. After two disappointing years job hunting, he discovered the fellowship program. His sponsor company, Foundation Technologies, Inc., hired him after graduation.

Although he makes less money, Daman says he finds his new job exciting and rewarding. "With a big industry laying people off and a little industry looking for people and the government trying to get people off unemployment, [the fellowship program] creates a win-win situation," he says.

Tom Goodwin, a 14-year Digital employee, couldn't agree more. After he was laid off in 1994, Goodwin filled out the fellowship's 12-page, essay-style application form, passed muster in the interview and began the program last February. His host company, Project Software and Development, Inc. in Cambridge, Mass., offered him a job in June.

"I'm very happy about being here. I feel it's a company I can grow in," Goodwin says. "I also believe that without the fellowship program, I'd still be out there with no income whatsoever, looking for work."

Seeking volunteers

CDG's mission is similar to the fellowship program, but its approach is less structured. CDG's goal is to help the unemployed find jobs through networking and gain skills by volunteering. "Potential employers no longer see an obsolete programmer," says John German, who founded CDG in 1991. "They see someone with enthusiasm."

Nicholas Quane works at the New York State Society of CPAs as a systems operator. He says his volunteer experience with CDG helped him get hired. "I got [the job] in part due to becoming a [Certified NetWare Engineer]," Quane says. "But any time I went to an interview and talked about the volunteer work, people were impressed. It showed I wasn't sitting around waiting for a job to fall into my lap and [that] I was using my CNE for something that would benefit me and the community."

Even volunteers who don't find jobs right away say the work is worthwhile. Perry Davis, former information technology director at Saatchi & Saatchi Advertising, learned about LANs and the Internet while volunteering at the National League for Nursing. "That experience has been of real value. Now I'm consulting and teaching — my own thing," Davis says. He is still looking for a job and is also helping CDG open a chapter in New Jersey.

Two of its earliest members, displaced mainframe professionals Clifford Hamburger and Hymen Cohen, are working again after two volunteer engagements. Neither found jobs as a direct result of their work with CDG, but Hamburger says the Windows skills he picked up will come in handy in his job as a programmer/analyst at the New York Transit Authority.

"Most people have a positive experience," Cohen says. "It adds to their knowledge and keeps them occupied in the work environment."

The only drawback is the pay issue. "If the companies were paying even five dollars an hour, [they] would take us more seriously," Hamburger says. CDG is currently seeking some paid assignments, although the group will continue to accept volunteer work.

Both programs are expanding. In addition to CDG's expansion into New Jersey, the Massachusetts Software Council is working out agreements in Rhode Island and New Hampshire. Host companies and consulting projects are always needed, so contact the programs at the numbers listed below if your company is interested in helping. ■

Wilde is a freelance writer in Easton, Conn.

At a glance

SOFTWARE COUNCIL FELLOWSHIP PROGRAM

What: Places job-seeking computer professionals at one of about 80 software companies in Massachusetts. The program welcomes new host companies.
Program length: Six months.
Requirements: A minimum of 10 years' experience in the computer, defense or electronics industry.
Acceptance: Difficult. At least 150 people apply for the 20 available spots in each class. New classes begin every two months.
Contact: Mary Cahill, executive director, Massachusetts Software Council, 101A First Ave., Waltham, Mass. 02154 (617) 890-0351

CAREER DEVELOPMENT GROUP

What: Helps bolster job-seeking skills and resumes. Finds volunteer work and places people who want to learn specific skills. The program welcomes new consulting projects.
Program length: Varies. Some volunteers have worked on projects lasting several months; others have continued to volunteer after accepting jobs.
Requirements: No specific knowledge is required, but a desire to learn new technical skills is mandatory.
Acceptance: Open. No one is turned away.
Contact: John German, founder, Career Development Group, 40 Wall St., Suite 2124, New York, N.Y. 10005 (212) 759-2368

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Software Engineer: Analyze, design, implement and test user and system level networking software for UNIX and embedded system platforms primarily using C and shell programming. Design, develop and use 1) UNIX internals and TCP/IP protocol suite; 2) STREAMS device driver development; 3) Debug-ging tools (applications and kernal) and 4) Source code control systems. Port network software to various UNIX platforms (SCO, SVR4, HP, Motorola). Modify and enhance network software to meet client requirements. Some customer interaction along with on-site work required. Implement projects at client sites and orient end users. Act as a project leader on specific assignments. 40hrs/wk, 8:30am - 5:30pm. $48,640/yr. Must have Masters degree in Computer Science. Must have 2 years experience in the job offered. Masters degree must include at least one course in 1) Computer Networks and 2) Operating Systems. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, IL 60605, Attn: Janet Aschenbrenner, Ref# V-IL-13247-A. NO CALLS. AN EMPLOYER PAID AD. SEND TWO COPEIS OF RESUME.

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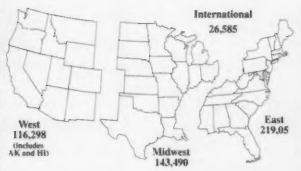
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PROGRAMMER ANALYST [2 openings] (Ref: 136795) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; analyze, design, develop & implement computer software for clients' EDP systems; design, develop, implement data processing & production systems; implement, maintain & modify customer database applications written in Visual Basic Prof. version, MS SQL server, SYBASE SQL server, Microsoft Access, ODBC, OLE, Windows SDK, Microsoft C, Visual C++, Crystal Reports, DB2, WMF, MDI Gateways, communications s/w & third party custom controls. Installation of the sys. at various customer sites, trouble shooting & technical support, implementation of Client/Server Systems, design of relational databases, Graphical User Interfaces, Mainframe-PC Communications & Insurance Industry. Reqs. Bach. in Comp. Sci., Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis, Mathematics or its equiv. in ed. & exp. & 1 yr. exp. in job offered or 1 yr. related exp. as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Must have some related exp. including analysis, design, development & using IBM Compatible (486), MS-DOS, MS-Windows, SDK tools, C, C++, Visual Basic & SQL Server. $40,000/yr. 40 hrs/wk., 8:30a-5p.
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Programmer/Analyst: Analyze and design software systems for the use by MCI NCBS Billing System under MVS utilizing COBOL, CICS, TSO/ISPF, VSAM, DB2 Database. Modify progams to take into account system or equipment configuration changes. Ensure data and program integrity across systems. $36,500/yr. 40 hpw; 8:30am-5pm. B.S. in Electrical Engineering, 2 yrs exp. in job offered or 2 yrs exp. as software engineer. Exp. in end user requirement specification, system analysis & design, coding, testing & implementation, documentation and maintenance support. Exp. in C, CICS, DB2, SQL, FOCUS, CLIST, Data Manager, IEW Case Tool and assembly language programming. Must have proof of legal authority to work in the U.S. Send your resume to D.E.S. Workforce Center, P.O. Box 729 (800 7th St., SE), Cedar Rapids, IA 52406-0729. Please refer to Job Order IA-1100401. Employer paid advertisement.

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Systems Analyst. 40 hr/wk from 9 a.m. to 5 p.m. Salary at $55,000/ yr. Job duties to include Design and develop software to implement clinical trials adverse monitoring system for drugs for pharmaceutical company, using UNIFACE, an advanced tool for designing 3-tiered client/server systems. The user interface is Windows 3.1 based and the backend database is RDB running on a VAX/VMS cluster using DECNET/TCP-IP for communications. Require Bachelor Degree with Electronics Eng, Computer Sci. as major and 1 year experience in job offered or 1 year experience as Programmer/Analyst. One year in job offered or as a programmer/ analyst must include use of UNIFACE, Windows, DECNET/ TCP-IP, DECSET Tools, Ingres, RDB, VAX, UNIX, C and Pathworks, and design of user interaction and database screen applications. Must have proof of legal authority to work permanently in the U.S. Please send two copies of resumes to Illinois Department of Employment Security, 401 South State Street-3 South, Chicago, Illinois 60605, Attention: James Gregory; Reference #V-IL 12725-Z. No Calls. An Employer Paid Ad.

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- For one position, fluency in COBOL and prior experience with SCT's line of Series Z/FRS/HRS financial systems in the VAX/OpenVMS operating system environment is an important quality.
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The current salary range for these positions (adjusted annually) is $31,000 to $47,000. The college provides an attractive benefits package which includes a generous pension program, medical and long-term disability insurance, one month annual vacation, life insurance, and tuition support for children.

Screening of candidates will begin on October 16 and will continue until the positions are filled. Applications, including a complete resume and the names of three professional references, should be directed to:

Michael Dieckmann,
Director of Administrative Computing Services
Irvin E. Houck Computing Center
Oberlin College • Oberlin, OH 44074
***Internet:* bmike@ocvaxc.cc.oberlin.edu**
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Senior Systems Analyst, 37.5hrs/wk., 8:30 am - 5:00pm, $44,052/year. Software design & development for mortgage insurance applications. Client/server systems. Networking. Computer security. Project management. Aion Expert systems. Tools: ORACLE; IBM RS6000; INFORMIX ESQL/C; TCP/IP; Solaris; VISUAL BASIC; Internet applications; Foundation CASE tool. B.S. in Computer Science as well as two years experience as a Senior Systems Analyst or Programmer required. Previous experience must include: programming for mortgage insurance applications using ORACLE; IBM RS 6000; Foundation CASE tool; VISUAL BASIC; Aion Expert systems; TCP/IP; Solaris. Send two copies of resume to: Travis Bartel, Jobs, Employment & Training Services, 201 E. Washington Avenue, Room 211X, Madison, WI 53702. Reference Case #950176.

PROGRAMMER ANALYST: (2 positions) 40 hrs/wk, 8 a.m. - 5 p.m., $45,000/yr. Carry out the analysis of program specifications, program design, coding and testing of computer application systems utilizing UNIX, SYBASE, and C. Requires bachelor's degree in Computer Science or Electrical Engineering. Reqr. 2 yrs. expr. in job offered, or 2. yrs. expr. in Systems Analysis &/or Programming &/or Software Engineering &/or Computer Consulting. Reqr. work expr. in dev. of s/w systems utilizing UNIX, SYBASE, and C "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref No: 153595.

Software Engineer, 40hrs/wk., 9am - 5pm, $38,570/year. Analysis, design, testing & programming of software for business applications using CMM (capability maturity models) principles. Tools: ORACLE; Excelerator; OS/2 Presentation Manager; CMM; C; C++; Assembler; UNIX; MS-Windows. M.S. in Computer Science as well as six months experience as a Software Engineer or Programmer required. Previous experience must include: ORACLE; C/UNIX; MS-Windows; Excelerator; OS/2 Presentation Manager; CMM methodology. Must have proof of legal authority to work permanently in the U.S. Send two copies of resume to: ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, IL 60605, Attention: Leila Jackson, Reference #V-IL-13224-J. NO CALLS. An Employer Paid Ad.

SOFTWARE ENGINEER: (2 positions) 40 hrs/wk, 8 a.m. - 5 p.m., $48,800/yr. Carry out analysis, design, coding, and testing of computer software application systems on IBM mainframe computers utilizing CICS, DB2, VSAM, and COBOL. Evaluate requirements for migration from the legacy system to client server system. Requires bachelor's degree in Computer Science or Electrical Engineering. Reqr. 3 yrs. expr. in job offered, or 3 yrs. expr. in Systems Analysis &/or Programming &/or Software Engineering &/or Computer Consulting. Reqr. work expr. in dev. of s/w systems on IBM m/f utilizing DB2, VSAM, and COBOL. "Employer paid ad." E.O.E. Send resumes to: 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref. No: 153895.

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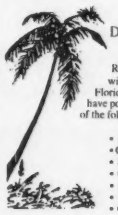
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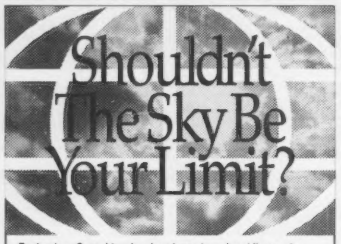
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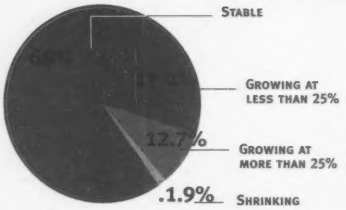
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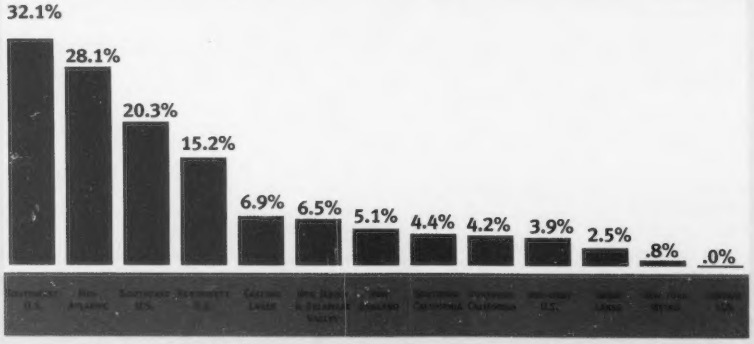
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Marketplace

ATM aspirations

Still testing the waters, telcos offer ATM services that are complex and pricey

By Lynn Haber

If your telephone company doesn't offer Asynchronous Transfer Mode (ATM) service, it will soon. As a matter of fact, all interexchange carriers, most local exchange carriers and many alternative access providers have made ATM services available.

"Most carriers have ATM in their infrastructure and are testing it in the marketplace, trying to figure out what access speeds to offer and at what price," says Adam Reeves, an industry analyst at Dataquest, Inc. in San Jose, Calif. The downside is ATM services are still expensive, not universally available and functionally limited.

Caroline Michels, research manager at International Data Corp. in Framingham, Mass., suggests looking at ATM from two perspectives: native ATM service and ATM-based services.

With native ATM, users get a direct connection to an ATM point of presence or carrier's switch. Users buy a native ATM pipe onto which they can attach voice, data, video and so on. This gives them control over the ATM connection.

On the other hand, an ATM-based service means users buy a turnkey solution, such as high-speed LAN-to-LAN interconnectivity or frame relay over ATM. "Today, services based on ATM are more commercially viable than native ATM," Michels says.

But native ATM is beginning to roll out on a significant basis, Michels adds. Network managers can buy bulk T3 (45M bit/sec.), which gives them access to the whole T3 circuit and allows them to break it up any way they like. Then they can buy a user-to-network interface and an ATM switch and connect to the ATM network.

For example, Pacific Bell offers FasTrak ATM Cell Relay Service, which is based on market-trial pricing. For access port speed DS-3 (40M bit/sec.), the company charges a $5,000 installation fee and $4,850 monthly. For an OC-3/C (140M bit/sec.) access port, Pacific Bell charges $8,500 for installation and $7,899 monthly, according to Ed Briones, product manager for ATM cell-relay services.

Managers looking to buy ATM-based services usually shop for high-speed or native LAN-to-LAN connectivity. In many cases, service providers offer the service within the ATM infrastructure, but customer priority is finding an answer to a particular problem.

Teleport Communications Group in New York, for example, offers high-speed LAN interconnection for Ethernet, Token Ring and Fiber Distributed Data Interface. Pricing is available on an individual contract basis and is determined by connection type and required bandwidth.

Most offerings are for high-speed access, which traditionally costs more. Carriers are addressing this issue by offering lower-speed DS-1 and T1 (1.544M bit/sec.) access. In fact, AT&T Corp. made T1 access commercially available this year.

But getting T1 access to ATM means little without the availability of ATM services. "T1 access will become a more viable option in the market as additional ATM features, such as variable bit rate [VBR] and continuous bit rate [CBR] become available," Michels says. She says carriers are just beginning to introduce additional features, such as ATM management and bandwidth control capabilities. As standards evolve, expect to see even more granularity and flexibility in access speeds offered, such as fractional T3 access to ATM.

Briones reports that Pacific Bell, under the tariff offerings it recently filed with the Federal Communications Commission, plans to offer a variety of throughputs from speeds as low as 64K bit/sec. up to 144M bit/sec. and many in between.

"We're doing our best to offer what the technology provides today," Briones says.

There are two drivers in today's ATM market: organizations that need large amounts of bandwidth for data traffic or want to aggregate data traffic over a large pipe, such as financial or insurance; and organizations whose requirement is application-driven, such as long-distance learning or telemedicine.

Those shopping for ATM services will find it complex because standards are still evolving and functionality is limited, as are the levels of service offered. Additionally, ATM is only a data market; video capability is still developing.

However, MFS Datacom recently announced the first voice-over-ATM service in the industry. Carriers also offer permanent virtual circuits only with switched virtual connections. This will give users bandwidth-on-demand type functionality a few years down the road.

For users to get the most out of ATM, it must provide a breadth of applications such as voice, data and video and support different classes of services. All carriers offer VBR services and most offer CBR services. Standards are still being developed for unspecified bit rate and available bit rate services. ■

Haber is a freelance writer in Boston.

Coming down the pike

If you're looking for ATM services from your telephone company, expect limited capability until 1997 and beyond. "Be clear about separating vision from reality in this market," says Eileen Healy, director and principal analyst for public networks at Dataquest. "You won't get the full vision of ATM with the first offerings." ATM will gain form and substance over time, industry analysts say. Watch for the following developments:

- A greater variety of access speeds from T1 to fractional T3 to OC-12 (622M bit/sec.) and more options in between.
- Greater flexibility, such as switched virtual circuits for bandwidth on demand and broader application support for voice, data and video.
- Improved migration and internetworking capability between services, such as frame relay and ATM, switched multimegabit data services and voice over ATM.
- Broadband intercarrier connectivity. Carriers are working on developing network-to-network interfaces as well as working relationships that allow interconnectivity among carriers' ATM networks. This means national ATM availability for users.
- Greater price flexibility and granularity. The market is just beginning to see usage-based charges. When available bit rate is defined, it will allow carriers to increase backbone use and pass savings on to customers.

– Lynn Haber

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INDEX

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Outsourcing/Remote Computing
Alicomp (800) 274-5556 pg 153
American Software (404) 264-5770 pg 155
Faneuil Systems (708) 574-3636 pg 155
Security
Secure It (800) 451-7592 pg 153
Systems & Services
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Advertisers' Index

Adobe	11
Amdahl	25
AT&T	9, 65, 67, 68, 122
AXENT Technologies	132
Banyan	72
Btrieve	29
Cabletron	128-129
Chipcom	C3
Cisco	70-71
Client/Server Summit	94
Coda	131
Cognos	66
Compaq Computer Corp.	18-19, 43-47
Computer Associates	3
Computerworld IS Leaders	136-137
CW Circulation	92
CW CSJ	33
CW Custom Publications	90
D&B Software	64
DB/Expo	88
Dell	30-31
Digital Equipment Corp.	120-121, 160
EMC Corp.	63
Encore	56
Exide Electronics	110-111
4th Dimension	24
Gifts in Kind America	108
Hewlett Packard	50-51, 82-83
IBM	26-27, 38, 52, 125, 127
ICS/Deloitte	62
Information Builders	17
Interface Group	40
Kingston	C4
LBMS	15
Lotus Development Corp.	22-23, 68, 85, 87, 89, 91, 93, 95
Madge Networks	104-105
Micro Focus	7
Microsoft	58-61, 78-79
Miller Freeman Expos	84
NEC Technology	37
NEC Electonics	102-103
Netscape	77
Nortel North America	81
Omaha Chamber of Commerce	20
Oracle	5
Pilot Software	48-49
Proteon	42
Racal Datacom	101
RCI, Ltd.	86
Rolm	116
SAS Institute	106-107, 108/109
Silicon Graphics	54-55
Software AG	119
Sprint	114-115
Sterling Software	96-97
Sun Microsystems	21
Texas Instruments	13
Unisys	98
VMark	18
Workstation Group	80
Zenith Data Systems	74-75

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Marketplace Advertisers' Index Pages 152-156

Alicomp	(800) 274-5556
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Companies in this issue

Page number refers to page on which story begins

3Com Corp. 73,133

A
Aberdeen Group, Inc. 1
Acer America Corp. 48
Adobe Systems, Inc. 39,49,159
Agile Networks, Inc. 133
Aim Technology, Inc. 65
Allstate Insurance Co. 4
Alternative Technologies, Inc. 4
Amdahl Corp. 8
America Online, Inc. 76
Amoco Corp. 14,28
Andrew Corp. 108
Apple Computer, Inc. 8,12 41,111,159
Argent Software, Inc. 69
Associated Financial Network . 24
Associated Grocers, Inc. 14
AT&T Corp. 1,14,24,92,152
AT&T Global Information Solutions 1,14,39,104
Avid Technologies, Inc. 49

B
Banyan Systems, Inc. 92,108
Bay Networks, Inc. 32
BDM International, Inc. 8
Bell Atlantic Corp. 12,39
Bell Canada 88
BIS Strategic Decisions 41,57
Blue Cross/Blue Shield of Florida 109
Borland International, Inc. 110
Box Hill Systems Corp. 108
Bridgestone/Firestone, Inc. 1
British Airways 14
Business Software Alliance 28
Byteware, Inc. 108

C
Cabletron Systems, Inc. 1,32
Cambar Software, Inc. 108
Canon Computer Systems, Inc. 41
Ceridian Corp. 1
Chevron Corp. 16
Cheyenne Software, Inc. 10
Chipcom 1
Chiron Corp. 100
Cim3, Inc. 16
Cimdata ITM 67
CIMI Corp. 73,126
Cincom Systems, Inc. 41
Cisco Systems, Inc. 32,90
Citibank NA 86
Claris Corp. 112
Coda, Inc. 99
Coleman Communications Co. .. 16
Collabra Software, Inc. 16
Compaq Computer Corp. ... 39,48
CompuServe, Inc. 8
Computer Associates International, Inc. 10,12,62
Computervision Corp. 67
Computone Corp. 94
Conner Peripherals, Inc. 8,65
Consumers Gas Co. 80
Control Data Systems, Inc. 67
Convex Computer Corp. 8
Corel Systems Corp. 39
CrossComm Corp. 133
CUNA Mutual Group 39
Cylink Corp. 32

D
Data General Corp. 8
Datapro Information Services Group 12,16,24
Dataquest, Inc. 4,8,53,152
David Strom, Inc. 90
Decisis, Inc. 123
Deja News, Inc. 162
Dell'Oro Group 32,73
Deloitte & Touche 99
DHL Systems, Inc. 53
DHL Worldwide Express 112
Diamond Head Software, Inc. 110
Diamond Multimedia Systems, Inc. 41
Digital Equipment Corp. 1,8 10,39,109,139
DMR Group, Inc. 8
Drummond Group 53
Dynasty Technologies, Inc. 109

E
Egghead, Inc. 39
Electronic Data Systems Corp. 39
Emergent Corp. 104
Emulex Corp. 62
Entrepreneurial Technologies, Inc. 90

F
Falcon Microsystems, Inc. 73
Farallon Computing, Inc. 90
Fauve Software 41
FedEx Corp. 161
Fidelity Investments 80
FirePower Systems, Inc. 8
First Albany Corp. ..16,28,130,133
Forte Software, Inc. 109
Foundation Technologies, Inc. 139
Fujitsu Ltd. 5,62

G
Gartner Group, Inc. .. 1,8,28,39,41
General Services Administration 28
Georgetown University 162
Global Growth Strategies 123
GNP Computers, Inc. 69
Grand Junction Networks, Inc. . 73
Groupe Bull 41

H
Hale and Dorr 73
Health Care Compare, Inc. 1,161
Hewlett-Packard Co. ..... 1,8,10,12 ... 48,57,62,65,88,94,108,104,110
Hibernia National Bank 161
Hitachi Ltd. 65
Houston Lighting & Power Co. 104
Hurwitz Consulting Group, Inc. ... 1
Hypercom, Inc. 92

I
IBM ..... 1,4,8,12,16,20,32 ..... 39,41,48,62,65,88,92 99,100,104,108,110,133,159
Imagery Software 65
Imaging Technology, Inc. 110
Inacom Corp. 39
Information Management Systems, Inc. 84
Informix Software 8
Infovision International 1
Intel Corp. 4,8,39,41,57,130
International Communications, Inc. 112
International Data Corp. 53, 62 152,161
International Technology Associates, Inc. 49
Internet Profiles Corp. 162
InterNex Information Services, Inc. 90
Interpact, Inc. 1

J
Jack Morton Productions, Inc. 57
Jon Peddie Associates 41
Jupiter Communications 86

K
KeyCorp 100
KPMG Peat Marwick 8
Kraft Food International 99

L
Lawson Software 99
Legato Systems, Inc. 65
Legent Corp. 92
Lightbridge, Inc. 139
Los Alamos National Bank 14
Lotus Development Corp. 3,8 16,69,100

M
Macromedia, Inc. 41
Madge Networks, Inc. 32
Magna Software Corp. 109
Marcam Corp. 99
Marshall McLuhan Center 162
Matrox Electronic Systems Ltd. 41
McAfee Associates, Inc. 92
McDonnell Douglas Computer Systems Co. 16
MCI Communications Corp. . 10,14
Meta Group, Inc. 16,48,73
MFS Datacom 152
Micrografx, Inc. 39
Microsoft Corp. ..... 1,4,8,12,16 ..... 28,39,41,53,69,80 94,108,109,111,113,159,161
Millipore Corp. 16
Mortice Kern Systems, Inc. ... 8,110
Motorola, Inc. 8,41

N
Nashoba Networks, Inc. 32,94
National Semiconductor Corp. . 41
National Steel Corp. 14
National-Standard Co. 10
Navisoft, Inc. 76
NCube Corp. 104
NECX Direct 1
Netlink, Inc. 92
NetManage, Inc. 32
NetSuite Development Ltd. 80
Network General Corp. 65,84
Network Peripherals, Inc. 92
Network Software Associates, Inc. 94
Networld/NetWorth, Inc. 73
New York Transit Authority 139
Newbridge Networks Corp. 8
Nissan Motor Corp. 76
Nortel, Inc. 39,94
Novell, Inc. 1,53,57,62 65,80,100,130,159,161

O
Open Applications Group, Inc. 99
Open Software Foundation 62
Open Text Corp. 16
Optimal Networks Corp. 86
Oracle Corp. 4,6,80,86,111

P
Pacific Bell 152
Perevod Services, Inc. 39
Philips Home Services, Inc. 86
Pick Systems, Inc. 104
Pinnacle Micro, Inc. 49
Plannet Crafters, Inc. 49
Platinum Technology, Inc. 65
Portland Public Schools 109
Primavera Systems, Inc. 69
Priority Pharmacy 4
Prodigy Services Co. 92
Progress Software, Inc. 88
Project Software and Development, Inc. 139
Promus Hotel Corp. 24
Pyramid Technology Corp. 104

R
Raychem Corp. 8
Raytheon Co. 139
RDI Computer Corp. 65
Ricoh Corp. 62
Risk Management Services Co. 57
Robichaux and Associates 69
RSA Data Security, Inc. 8,32

S
Saatchi & Saatchi Advertising Worldwide, Inc. ... 139
Saber Software Corp. 92
SAP AG 1
SAS Institute, Inc. 94
SCO, Inc. 1,161
Seagate Technology, Inc. 8
Security Dynamics, Inc. 88
Sequent Computer Systems, Inc. 104
Sherpa Corp. 67
Shiva Corp. 8
SHL Systemhouse, Inc. 14
Siemens/Nixdorf Information Systems, Inc. 62
Socket Communications, Inc. .. 69
SoftArc, Inc. 69
Software 2000, Inc. 99
Spry, Inc. 8
Standard Microsystems Corp. . 32
StarNine Technologies, Inc. 8
Starwave Corp. 76
State Industries, Inc. 14
Steamboat Ski Co. 76
Sterling Software, Inc. 92
Storage Technology Corp. 10
Stream International, Inc. 39
Summit Strategies, Inc. 39
Sun Microsystems, Inc. 1 8,12,62,69,76,94,100,110,130
SunSoft, Inc. 8,65
Sybase, Inc. 4,65,80
System Software Associates, Inc. 99

T
Tadpole Technologies, Inc. 73
Tandem Computers, Inc. 111
Tatung Science and Technology, Inc. 8,41
TCAM Systems, Inc. 109
Teknekron Software Systems, Inc. 8
TeleChoice, Inc. 1,12,32
Teleport Communications Group 152
Tenneco Gas Co. 80
TennEcon Services 80
The Standish Group International, Inc. 20
The Yankee Group, Inc. . 80,86,99
Time Line Solutions Corp. 69
Tivoli Systems, Inc. 12
Toro Co. 67
TRW, Inc. 117

U
U.S. Postal Service 12
US West Communications, Inc. 92

V
Van den Bergh Foods, Inc. 162
VanStar Corp. 39

W
W. T. Quinn, Inc. 1
Walker, Richer & Quinn, Inc. 8,108
Web Professionals, Inc. 1
Westbrook Technologies, Inc.. 57
Whirlpool Corp. 117
Whitetree Network Technologies 130
Widener University 53
Wildfire Communications, Inc. 73
Wisconsin Electric Power Co. .. 39
WorkGroup Technologies, Inc. 8,39
Wyse Technology, Inc. 49

X
XcelleNet, Inc. 8
Xerox Corp. 76
Xylan Corp. 133

Z
Zenith Data Systems 41

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Gainers

Percent

SHL Systemhouse(H)	74.1
Ascend Communications(H)	22.0
Micron International Inc.(H)	22.0
Conner Peripherals(H)	19.3
US Robotics(H)	18.9
LSI Logic Corp.(H)	17.4
State of the Art	17.1
FORE Systems Inc.	15.4

Dollar

Ascend Communications(H)	15.38
US Robotics(H)	14.38
Peoplesoft(H)	10.31
LSI Logic Corp.(H)	9.00
Dell Computer Corp.(H)	6.75
Netscape Comm. Corp.	6.50
SHL Systemhouse(H)	5.38
DSC Communications(H)	5.25

Losers

Percent

Rainbow Technologies Inc.	-21.4
American Power Conversion(L)	-18.8
MapInfo Corp.	-10.5
Scientific Atlanta Inc.(L)	-10.3
Group I Software	-10.2
ParcPlace Systems Inc.	-10.2
Magic Software Enterprises	-10.1
Data Race Inc.	-9.7

Dollar

Rainbow Technologies Inc.	-5.13
Progress Software Corp.	-4.63
Microsoft Corp.	-3.38
American Power Conversion(L)	-3.00
MapInfo Corp.	-2.50
Network Equipment Tech.	-2.00
Scientific Atlanta Inc.(L)	-2.00
Computer Sciences(H)	-1.88

Industry Average

Adobe vaults over stumbles

Adobe Systems, Inc.'s **(ADBE)** stock last week lived up to the name of one of the company's most popular products — Acrobat. After reports that the company's third-quarter earnings weren't up to analysts' expectations, the Mountain View, Calif., firm's stock price tumbled, leaped and tried to balance itself (see chart).

Although profits slipped below expectations, Adobe still ranked fourth in PC software revenue during the first half of 1995, according to Dataquest, Inc., just behind giants **Microsoft Corp. (MSFT), IBM (IBM)** and **Novell, Inc. (NOVL)**.

Despite these lackluster results, Adobe's stock price rose to its highest point this month. "Their stock has a history of unpredictable movement," with frequent high trading volume and wide price swings, said Ben Rose, a market analyst at Hancock Institutional Equity Services in Boston.

Adobe attributed the lower earnings to a sharp decline in European business and delays in shipping the latest release of its Pagemaker. Rose said this was "a reasonable explanation for last quarter, but the pressure is on Adobe to show that this was just a one-quarter phenomenon."

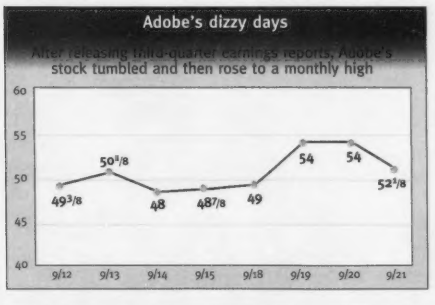
He added that Adobe expects a full quarter's sales of Pagemaker in both Macintosh and Windows 95 releases to bring earnings back to forecasted levels. Other analysts said the market shortage of **Apple Computer, Inc.**'s **(AAPL)** Macintoshes may have held back Adobe's sales for this quarter.

Rose believes Adobe is well positioned in the electronic publishing market with its Acrobat product.

"Acrobat is starting to become a standard in both the Internet and digital publishing fields," he said. He said there is "lots of long-term potential in several Adobe products."

And maybe a backflip or two along the way.

— Stewart Deck and Tim Ouellette



Exch	52-Week High	52-Week Low		Sep. 22 3 PM	Wk Net Change	Wk Pct Change
Communications and Network Services						**UP 2.44%**
OTC	49.00	17.00	3COM Corp. (H)	47.25	3.63	8.3
NYS	52.75	38.00	AMERITECH Corp. (H)	51.63	-0.38	-0.7
NYS	65.13	47.25	AT&T (H)	62.63	4.38	7.5
OTC	85.25	10.88	Ascend Communications (H)	85.25	15.38	22.0
OTC	19.75	10.00	Banyan Systems Inc.	10.50	-0.25	-2.3
OTC	57.13	23.13	Bay Networks Inc. (H)	54.13	2.25	4.3
NYS	61.88	48.38	Bell Atlantic Corp. (H)	60.88	-0.13	-0.2
NYS	73.25	50.50	Bellsouth Corp. (H)	71.75	-1.13	-1.5
NYS	39.38	12.63	Bolt, Beranek & Newman	36.13	0.63	1.8
OTC	22.25	9.00	Brooktrout Technology	19.88	-0.13	-0.6
NYS	68.00	37.38	Cabletron Systems (H)	67.00	5.00	8.1
OTC	22.25	12.25	Centigram Communications	17.38	-0.13	-0.7
OTC	51.13	20.00	Chipcom Corp. (H)	49.63	3.88	8.5
OTC	73.88	23.63	Cisco Systems Inc. (H)	70.63	0.69	1.0
OTC	11.38	6.13	Compression Labs Inc.	8.00	-0.38	-4.5
OTC	12.75	5.63	Computer Network Tech.	7.94	-0.31	-3.8
OTC	14.50	7.50	CrossComm	13.88	0.00	0.0
OTC	4.50	2.13	Data Switch Corp.	4.31	0.00	0.0
OTC	63.38	26.88	DSC Communications (H)	63.00	5.25	9.1
OTC	42.00	19.38	FORE Systems Inc.	37.50	5.00	15.4
NYS	35.88	9.25	General Datacomm Inds.	13.00	0.25	2.0
NYS	39.00	29.50	GTE Corp. (H)	38.00	0.13	0.3
NYS	128.00	77.00	ITT Corp. (H)	125.88	-0.63	-0.5
OTC	26.88	17.25	MCI Commmunications Corp. (H)	26.88	1.19	4.6
OTC	15.75	5.50	MICOM Communications Corp.	10.88	-0.13	-1.1
OTC	22.25	6.63	Microcom Inc.	18.94	-0.81	-4.1
OTC	10.50	4.38	Netrix Corp.	5.25	-0.19	-3.4
OTC	12.00	3.25	Network Computing Devices	6.63	-0.13	-1.9
NYS	39.75	12.50	Network Equipment Tech.	35.00	-2.00	-5.4
OTC	44.75	17.13	Network General (H)	42.13	-0.25	-0.6
NYS	43.38	27.00	Newbridge Networks Corp.	29.63	0.25	0.9
NYS	41.00	31.25	Northern Telecom Ltd.	35.25	-1.38	-3.8
OTC	23.25	14.13	Novell Inc.	19.38	0.31	1.6
NYS	48.75	35.63	Nynex Corp. (H)	47.75	0.75	1.6
OTC	42.63	17.75	Octel Communications Corp. (H)	39.75	-1.38	-3.3
OTC	43.25	8.50	Optical Data Systems Inc. (H)	40.25	2.25	5.9
OTC	8.38	2.13	Penril Data Comm Networks	7.25	-0.25	-3.3
OTC	62.00	15.38	Picturetel Corp.	54.88	1.38	2.6
OTC	10.75	3.75	Proteon Inc.	9.00	-0.88	-8.9
OTC	7.88	3.00	Racotek Inc.	7.13	0.25	3.6
OTC	6.75	3.50	Retix	4.88	0.00	0.0
NYS	24.88	17.38	Scientific Atlanta Inc. (L)	17.38	-2.00	-10.3
NYS	54.75	39.25	Southwestern Bell Corp. (H)	54.38	0.13	0.2
NYS	39.63	25.88	Sprint Corp.	35.75	-0.25	-0.7
OTC	31.63	12.50	Standard Microsystems Corp.	16.50	0.50	3.1
OTC	57.50	17.38	Stratacom Inc.	50.75	0.25	0.5
OTC	8.13	3.63	Telebit Corp.	4.25	-0.25	-5.6
OTC	90.38	15.38	US Robotics (H)	90.38	14.38	18.9
NYS	47.88	29.63	US West Inc. (H)	46.88	-0.13	-0.3
OTC	23.50	9.13	Xircom	14.25	0.75	5.6
OTC	58.75	11.00	Xylogics Inc. (H)	55.00	1.88	3.5
PCs and Workstations						**UP 2.34%**
OTC	9.63	3.63	Advanced Logic Research	8.88	0.38	4.4
OTC	50.13	32.50	Apple Computer Inc.	37.00	0.50	1.4
OTC	19.13	10.38	AST Research Inc.	10.50	-1.00	-8.7
NYS	54.75	30.75	Compaq Computer Corp.	48.13	-1.38	-2.8
OTC	93.88	35.38	Dell Computer Corp. (H)	89.50	6.75	8.2
OTC	32.75	16.00	Gateway 2000 Inc.	29.75	0.38	1.3
NYS	85.88	41.75	Hewlett Packard Co.	83.25	1.75	2.1
OTC	29.13	3.00	Micron International Inc. (H)	29.13	5.25	22.0
NYS	45.63	23.38	Silicon Graphics	36.75	-1.38	-3.6
OTC	62.00	27.13	Sun Microsystems Inc.	57.63	1.50	2.7
NYS	64.38	41.00	Tandy Corp.	62.88	-0.75	-1.2
Large Systems						**UP 0.86%**
ASE	13.63	8.00	Amdahl Corp.	10.00	-0.13	-1.2
NYS	8.88	3.63	Convex Computer	5.63	0.63	12.5
NYS	74.38	14.63	Cray Research Inc.	23.75	0.25	1.1
NYS	12.00	7.75	Data General Corp.	10.00	-0.50	-4.8
NYS	49.50	24.88	Digital Equipment Corp.	39.88	-0.38	-0.9
OTC	5.56	1.06	Encore Computer Corp.	2.13	-0.06	-2.9
OTC	18.50	9.25	Harris Computer Systems Corp.	16.38	1.38	9.2
NYS	114.63	67.38	IBM	94.38	2.00	2.2
OTC	10.50	3.00	Meridian Data Inc.	9.50	-0.25	-2.6
OTC	12.25	4.25	NetFrame	6.63	0.00	0.0
OTC	25.38	14.13	Sequent Computer Sys.	22.88	-0.13	-0.5
OTC	15.00	3.13	Sequoia Systems Inc.	7.88	0.38	5.0
NYS	39.88	23.00	Stratus Computer Inc.	27.75	0.50	1.8
NYS	19.75	11.75	Tandem Computers Inc.	12.75	0.25	2.0
OTC	7.63	3.38	TriCord Systems	4.75	-0.25	-5.0
NYS	13.63	7.75	Unisys Corp.	7.88	-0.25	-3.1
Software						**UP 0.39%**
OTC	66.50	27.25	Adobe Systems Inc.	52.13	3.88	8.0
OTC	8.63	2.50	American Software Inc.	7.88	-0.13	-1.6
OTC	33.00	9.75	Applix Inc.	26.50	0.50	1.9
OTC	53.00	28.75	Autodesk Inc.	49.50	-0.25	-0.5
OTC	7.88	2.00	Bachman Info. Systems	6.75	0.63	10.2
OTC	36.50	22.00	BGS Systems Inc. (H)	35.50	0.50	1.4
OTC	50.50	20.50	BMC Software Inc. (H)	49.50	2.25	4.8
OTC	31.25	19.75	Boole & Babbage	30.13	-0.38	-1.2
OTC	17.25	6.00	Borland Int'l. Inc.	15.63	0.38	2.5
OTC	11.75	5.75	Brock Control Systems Inc.	7.75	0.00	0.0
OTC	3.75	1.78	CE Software	2.00	-0.06	-3.0
ASE	30.75	8.75	Cheyenne Software Inc.	19.50	-1.00	-4.9
OTC	35.38	11.75	Cognos Inc.	32.00	-1.50	-4.5
NYS	51.75	27.88	Computer Associates	42.50	-1.00	-2.3
NYS	14.38	2.63	Computervision Corp.	12.63	-0.25	-1.9
OTC	49.25	21.50	Compuware Corp.	22.25	-1.50	-6.3
OTC	42.38	10.75	Comshare Inc.	29.25	-0.50	-1.7
OTC	19.50	10.13	Corel Corp.	16.69	0.31	1.9
OTC	16.25	9.00	Dataware Technologies Inc.	13.69	0.50	3.8
OTC	51.00	21.50	Filenet Corp.	46.50	0.00	0.0
OTC	8.25	3.38	4th Dimension	6.13	0.00	0.0
OTC	33.00	13.75	Frame Technology	26.88	1.88	7.5
OTC	35.50	19.00	FTP Software Inc.	28.25	2.88	11.3
OTC	26.00	8.00	Group I Software	11.00	-1.25	-10.2
OTC	13.88	8.25	Gupta	9.56	1.06	12.5
OTC	12.00	4.63	Hogan Systems Inc.	9.88	0.00	0.0
OTC	54.50	31.25	Hyperion Software Corp. (H)	54.50	2.25	4.3
OTC	18.63	11.25	Information Resources	13.75	0.25	1.9
OTC	34.38	11.13	Informix Corp. (H)	33.63	3.50	11.6
OTC	14.38	7.13	Intergraph Corp.	12.13	-0.25	-2.0
OTC	11.00	2.88	Interleaf Inc.	10.50	0.13	1.2
OTC	26.25	11.00	Intersolv Inc.	20.63	0.25	1.2
OTC	51.25	19.38	Intuit Inc. (H)	51.25	4.75	10.2
OTC	48.25	23.00	Legent Corp.	47.13	0.00	0.0
OTC	11.50	3.63	Magic Software Enterprises	7.75	-0.88	-10.1
OTC	16.75	6.75	Manugistics Group Inc. (H)	16.25	0.13	0.8
OTC	40.00	16.50	MapInfo Corp.	21.25	-2.50	-10.5
OTC	7.38	2.00	MathSoft	6.25	-0.13	-2.0
OTC	55.75	8.00	McAfee Associates (H)	53.00	-1.50	-2.8
OTC	21.38	9.75	Mentor Graphics	20.00	-0.38	-1.8
OTC	15.00	10.75	Micro Focus	11.50	0.00	0.0
OTC	13.88	5.00	Microgrape Inc.	12.88	0.38	3.0
OTC	109.25	53.88	Microsoft Corp.	90.63	-3.38	-3.6
OTC	27.25	9.50	NetManage Inc. (H)	25.81	2.56	11.0
OTC	74.75	45.75	Netscape Comm. Corp.	58.75	6.50	12.4
OTC	47.00	24.75	Oracle Corp. (H)	38.88	1.25	3.3
OTC	63.75	27.75	Parametric Technology	61.50	1.38	2.3
OTC	23.25	7.88	ParcPlace Systems Inc.	11.00	-1.25	-10.2
OTC	86.50	21.75	Peoplesoft (H)	85.13	10.31	13.8
OTC	14.38	5.38	Phoenix Technologies (H)	13.88	0.38	2.8
OTC	16.88	6.50	Platinum Software	11.88	-1.13	-8.7
OTC	26.00	13.50	Platinum Technology	23.25	-1.50	-6.1
NYS	67.25	29.50	Progress Software Corp.	57.50	-4.63	-7.4
OTC	22.13	1.94	Quarterdeck Corp.	19.25	0.38	2.0
OTC	26.75	11.13	Rainbow Technologies Inc.	18.88	-5.13	-21.4
OTC	10.13	2.00	Rasterops	8.38	0.00	0.0
OTC	7.75	3.00	Ross Systems	7.13	0.50	7.5
OTC	51.75	12.63	Softkey International Inc. (H)	47.88	1.63	3.5
OTC	6.25	2.88	Software Publishing Corp.	4.50	0.00	0.0
OTC	12.50	5.25	State of the Art	12.00	1.75	17.1
NYS	47.88	28.63	Sterling Software Inc.	46.25	0.63	1.4
OTC	20.25	4.63	Struct. Dynamics Research (H)	18.38	-0.88	-4.5
OTC	55.00	19.88	Sybase Inc.	33.00	-0.25	-0.8
OTC	33.25	14.63	Symantec Corp.	31.75	0.25	0.8
OTC	34.50	19.75	SynOpsys	32.75	1.69	5.4
OTC	39.88	10.63	System Software Assoc.	39.88	8.63	13.1
OTC	18.13	5.50	Systemsoft Corp.	13.50	-0.38	-2.7
OTC	24.00	7.88	ViewLogic Systems	14.38	0.13	0.9
OTC	22.00	10.75	VMark Software Inc.	17.00	-1.00	-5.6
OTC	9.19	4.63	Walker Interactive Systems	9.19	0.94	11.4
OTC	55.50	15.00	Wall Data Inc.	18.75	-0.50	-2.6
OTC	19.50	9.13	Wang Laboratories Inc.	16.88	-0.81	-4.6
Semiconductors						**UP 1.59%**
NYS	39.25	22.25	Advanced Micro Devices	33.13	-0.88	-2.6
NYS	39.50	19.63	Analog Devices Inc.	36.50	1.88	5.4
OTC	36.75	14.50	Atmel Corp.	34.13	1.13	3.4
OTC	15.88	4.63	Chips and Technologies	14.50	0.25	1.8
OTC	61.13	10.50	Cirrus Logic (H)	56.88	2.13	3.9
NYS	55.50	15.00	Cypress Semiconductor Corp.	38.25	-0.50	-1.3
NYS	24.88	13.38	Dallas Semiconductor	21.00	-1.13	-5.1
OTC	34.25	11.63	Integrated Silicon Systems	30.00	-0.75	-2.4
OTC	78.38	28.75	Intel Corp.	61.13	-1.25	-2.0
NYS	62.50	16.13	LSI Logic Corp. (H)	60.63	9.00	17.4
OTC	63.00	15.50	Lattice Semiconductor	36.63	0.25	0.7
NYS	94.75	15.25	Micron Technology	85.75	-1.63	-1.9
NYS	82.50	49.00	Motorola Inc. (H)	78.50	0.00	0.0
NYS	33.63	14.38	National Semiconductor	29.50	-0.38	-1.3
OTC	57.50	13.00	Sierra Semiconductor	52.25	0.50	1.0
NYS	83.50	12.75	Texas Instruments (H)	80.25	4.25	5.6
OTC	39.13	10.25	VLSI Technology (H)	36.38	2.50	7.4
OTC	6.88	1.78	Weitek (H)	5.38	-0.13	-2.3
ASE	22.13	13.13	Western Digital Corp.	18.00	0.63	3.6
OTC	55.50	15.00	Xilinx	49.88	1.38	2.8
OTC	54.13	37.38	Zilog Inc.	45.00	-0.38	-0.8
Peripherals and Subsystems						**OFF 0.89%**
OTC	25.88	13.00	American Power Conversion (L)	13.00	-3.00	-18.8
OTC	47.25	17.25	Adaptec Inc.	41.88	0.63	1.5
OTC	27.25	14.75	Banctec Inc.	19.75	-0.50	-2.5
OTC	13.13	3.38	Cambex Corp.	12.38	0.38	3.1
ASE	6.38	1.38	Cognitronics Corp.	5.31	-0.06	-1.2
NYS	19.25	9.00	Conner Peripherals (H)	17.75	2.88	19.3
OTC	19.50	5.88	Creative Technologies Inc.	12.88	0.38	3.0
OTC	13.13	3.50	Data Race Inc.	5.25	-0.56	-9.7
ASE	9.38	4.25	Databram Corp.	8.75	-0.19	-2.1
NYS	27.38	14.75	EMC Corp.	18.75	-0.13	-0.7
OTC	28.50	8.50	Emulex Corp.	17.50	-0.50	-2.8
OTC	20.00	11.25	Evans & Sutherland	18.75	-0.50	-2.6
OTC	24.00	11.75	Exabyte	13.63	-1.25	-8.4
OTC	4.38	1.88	Intelligent Info. Systems	2.94	-0.06	-2.1
OTC	30.00	2.88	Iomega Corp.	26.25	1.38	5.5
OTC	7.88	2.00	IPL Systems Inc.	6.00	-0.25	-4.0
OTC	74.88	22.25	Komag Inc.	69.63	-1.38	-1.9
OTC	7.25	2.63	Maxtor Corp.	4.75	-0.50	-9.5
OTC	11.50	4.00	Micropolis Corp.	6.38	-0.50	-7.3
OTC	23.75	8.75	Pinnacle Micro Inc.	20.75	0.69	3.4
OTC	38.75	10.75	Printronix Inc.	29.50	-0.75	-2.5
NYS	10.50	4.00	QMS Inc.	4.88	-0.13	-2.5
OTC	28.50	13.75	Quantum Corp.	23.25	1.13	5.1
OTC	15.00	6.75	Radius Inc.	7.88	0.00	0.0
NYS	11.25	6.38	Recognition International	10.38	0.13	1.2
OTC	7.00	0.31	Rexon Inc. (L)	0.56	0.00	0.0
OTC	49.38	22.88	Seagate Technology	44.38	-0.13	-0.3
NYS	34.13	17.88	Storage Technology	25.88	0.75	3.0
NYS	56.25	31.38	Tektronix Inc. (H)	55.75	2.75	5.2
NYS	133.88	90.63	Xerox Corp. (H)	131.50	1.88	1.4
Services						**UP 1.48%**
OTC	28.00	14.38	American Mgmt. Systems (H)	25.75	-1.63	-5.9
OTC	3.13	0.56	Anacomp Inc.	0.63	0.00	0.0
OTC	31.25	14.75	Analysts Int'l.	30.00	0.00	0.0
NYS	70.88	36.75	Auto Data Processing (H)	69.63	0.63	0.9
OTC	48.00	14.00	Cambridge Tech. Partners	46.50	1.00	2.2
NYS	46.88	23.50	Ceridian Corp.	44.50	-1.25	-2.7
NYS	32.50	19.38	Comdisco Inc.	29.38	0.00	0.0
OTC	23.75	7.25	Computer Horizons	20.00	-1.50	-7.0
NYS	63.75	41.00	Computer Sciences (H)	60.75	-1.88	-3.0
NYS	16.13	7.50	Computer Task Group (H)	15.38	-0.38	-2.4
NYS	43.88	9.50	CompUSA Inc. (H)	43.63	2.25	5.4
OTC	11.00	5.38	Control Data Systems Inc. (H)	10.75	-0.06	-0.6
OTC	14.25	6.75	Egghead Discount Software	10.88	-0.69	-5.9
NYS	47.50	34.75	General Motors E (EDS)	46.13	0.25	0.5
OTC	15.25	6.88	Inacom Corp.	14.00	-0.50	-3.4
OTC	17.50	7.50	Intelligent Electronics	9.06	-0.56	-5.8
OTC	10.88	3.88	Merisel	6.88	-0.13	-1.8
OTC	15.00	8.50	Microage Inc.	11.75	-0.50	-4.1
OTC	46.00	23.13	Paychex (H)	44.75	0.00	0.0
NYS	54.25	37.25	Policy Management Sys.	52.25	-0.25	-0.5
NYS	36.63	22.25	Reynolds and Reynolds (H)	35.13	-1.25	-3.4
OTC	24.50	16.75	SEI Corp.	21.00	-0.75	-3.4
OTC	42.75	25.38	Shared Medical Systems	40.63	1.50	3.8
OTC	13.00	4.00	SHL Systemhouse (H)	12.63	5.38	74.1
OTC	26.50	12.00	Software Spectrum Inc.	25.00	0.75	3.1
OTC	31.75	16.88	Sungard Data Systems	29.25	-0.50	-1.7

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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- Maximum drives per controller: 42
- Built-in diagnostics



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THE PAPER AND INK USED IN THE ORIGINAL PUBLICATION MAY AFFECT THE QUALITY OF THE MICROFORM EDITION.

Privacy fades for Web visitors

Lust for data, new tracking techniques dog users

By Mitch Betts

Every post you make, every click you take, they'll be watching you.

With Internet marketers eager to monitor visitors to their World Wide Web sites and the emergence of powerful new data collection technologies, privacy advocates are concerned that the Internet's culture of commercial-free anonymity is fading fast.

"People don't realize that every time they enter cyberspace they leave a trail — a trail that others can follow," said Nelson Thall, research director at the Marshall McLuhan Center for Media Sciences in Toronto.

For example, employers can use a search engine to read the messages that employees or applicants post on Usenet newsgroups.

Meanwhile, Web site owners are installing tracking systems and adding questionnaires to satisfy their hunger to know who is visiting and how long they spend at particular Web pages (see story at right).

Deja News, Inc., for example, provides a valuable research tool that allows users to retrieve Usenet articles from a 4G-byte database via keyword searches. A by-product of the search is that with a single mouse click on the author's name, a profile of the author's recent Usenet messages appears (see chart).

Employers, marketers, private investigators and anyone else can discern the author's cybersurfing interests from the newsgroup names — for example, rec.gardens — and peek at the individual messages.

Steve Madere, president of Deja News in Austin, Texas, said he checks the Usenet posts of job applicants to get clues about their technical skills and public conduct. "I can see if they posted in an intelligent or offensive way," Madere explained.

Is that an invasion of privacy?

"Posting on Usenet is akin to standing in a public square with a microphone and screaming things into a tape recorder," Madere said. "You cannot possibly be concerned about privacy if you deliver a message to thousands of machines worldwide that have the sole purpose of showing that message to hundreds of thousands of people."

Deja view

The Deja News search engine (**http://www.dejanews.com/**) allows users to retrieve specific Usenet messages and create a profile of individual authors. This is a sample profile.

Deja News RESEARCH SERVICE

Author Profile: John Doe <jdoe@domain.com>
23 articles posted between 1995/04/06 and 1995/08/01
Number of articles posted to individual newsgroups:

7 misc.invest.stocks
7 comp.os.os2.misc
5 rec.gardens
2 rec.gambling.misc
2 misc.activism.progressive

Only getting bigger

Meanwhile, although the Internet has often been the target of small-time "spammers," who broadcast advertising messages for immigration cards and diet plans, for example, experts say that small dose of commercialism will grow in volume and sophistication.

Last month, for example, the nonprofit McLuhan Center ran an experiment showing how easy it is to build an electronic mailing list for direct marketing. Using a software agent that "crawls" the Internet scooping up E-mail addresses, the center was able to obtain 5,000 names in a matter of minutes.

Who's there?

Marketers on the Web, frustrated by the lack of data about their Web visitors, are turning to audience-tracking companies such as Internet Profiles Corp. (I/Pro) in San Francisco.

One I/Pro service requires users to provide demographic data to get certain benefits, while another tracks visitors down to the domain level, such as sun.com.

I/Pro spokeswoman Tina Lin said Web site owners want even more specific data about visitors, but I/Pro has held them off to avoid a privacy backlash. "It's a fine line. We have to be sensitive to both sides," Lin said.

The responsible way to monitor Web usage and collect marketing data is to provide an up-front privacy notice and check-off boxes so that consumers can control how their personal data will be used, said Mary J. Culnan, a privacy expert at Georgetown University in Washington.

"If users are assuming they're anonymous and in fact they're not, that's not fair," she said.

—Mitch Betts

Inside Lines

Windows of opportunity

IBM's dim view of Windows has cleared in the wake of Chairman Lou Gerstner's midsummer concession that Microsoft owns the desktop outside of the large data processing shops that are IBM's best customers. Directions from on high now state that IBM's software development groups should move with haste to support Windows and Windows NT, according to insiders. That's an adjustment from early this year, when IBM throttled back on plans to market NT versions of its software so that it could push OS/2.

Negotiating over the 'net

This week, the U.S. Chamber of Commerce, AT&T, GE Information Services and a host of other industry heavyweights will rollout IBEX, the International Business Exchange. IBEX is an on-line service designed to facilitate import/export and other trading activities using PC/modem connections to an X.400 E-mail system. The global electronic commerce system, which features full electronic data interchange capabilities, is designed to match IBEX subscribers with potential business partners.

CompuServe/Prodigy rumors false . . .

Contrary to published reports last week, on-line service provider CompuServe has no plans to buy any or all of rival Prodigy, according to top executives speaking last week at a developers conference in San Francisco. "There is no truth to that, and I have no idea how these things get started," said Bob Massey, president and CEO of CompuServe. Prodigy President Ed Bennett joked that he would not be looking for a house in Columbus, Ohio — CompuServe's headquarters — nor would Massey be moving to Prodigy's White Plains, N.Y., locale anytime soon.

. . . but other on-line deals are gurgling

IBM and Netscape are "speaking about a number of issues and possible relationships," not the least of which is a deal to make Netscape's Navigator browser a key interface for Prodigy users, according to an IBM spokesman. IBM and Sears jointly own the Prodigy network. IBM also wants to put a button on Navigator that leads users to IBM's new Infomarket search tool (see story, page 16).

Fledging Blackbird eyes the on-line sky

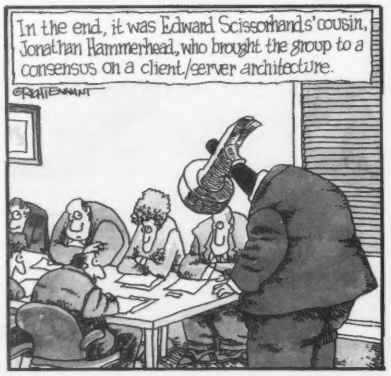
Microsoft plans to release its on-line application development tool, code-named Blackbird, in January, a company official said last week at a demonstration of a beta edition in San Francisco. That version, however, was designed to build programs only for The Microsoft Network. A beta version of Blackbird for building more general Web applications is due out in the first half of next year, the official said. However, he declined to specify a ship date for a road-ready edition of the product.

Pump up the Notes!

Lotus this week unwraps its Lotus Notes Pump, which lets Notes users retrieve information from relational databases such as Oracle and Sybase. The Notes Pump will connect to Informix databases through an ODBC driver. With the product, Lotus will compete with some of its business partners, including Brainstorm Technologies, Casahl Technology and Percussion Software.

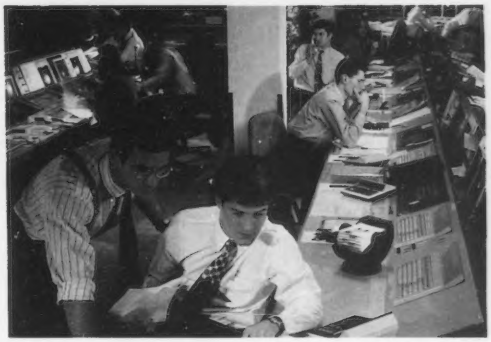
Coming soon . . . NT Expo? The funny thing about trade shows is that organizers can easily manipulate the attendance figures to make themselves look good. For example, promoters of last week's Unix Expo claimed 35,000 Unix zealots were cramming the aisles in search of products (or free T-shirts). But opening day turnout was minuscule at best; there couldn't have been more than 5,000 people on hand. Maybe the 35,000 figure included the marketeers and salespeople milling about. Fill up our tip line with a news tip! To contact Computerworld *about news items or tips, call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at maryfran_johnson@cw.com.*

The 5th Wave *by* Rich Tennant

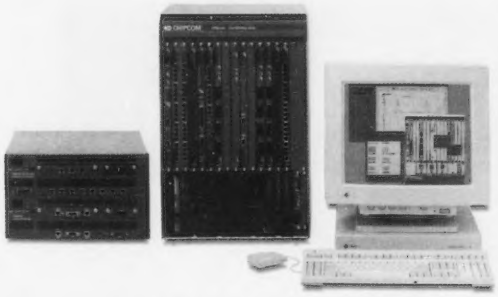


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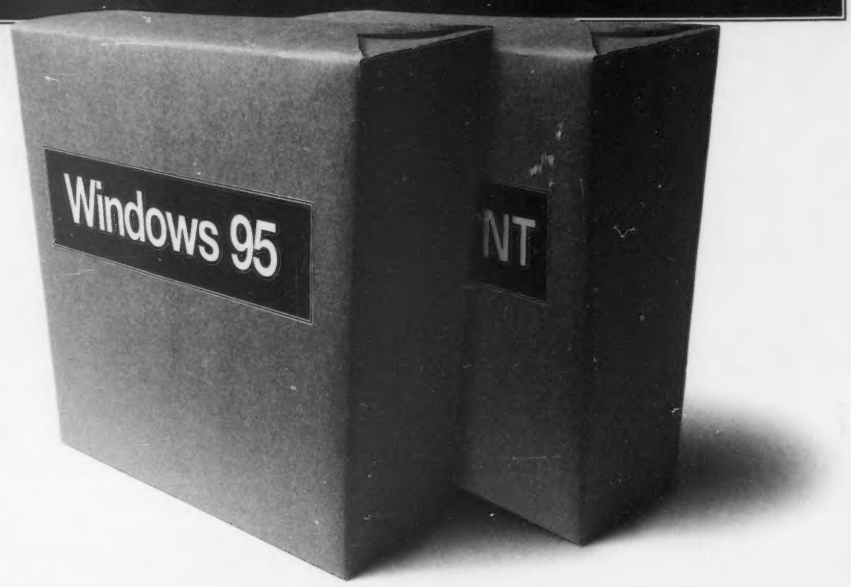
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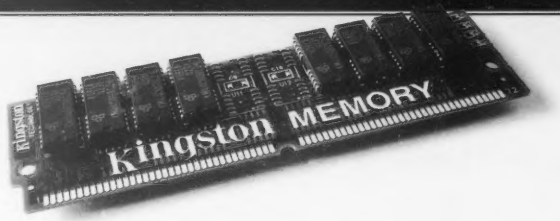
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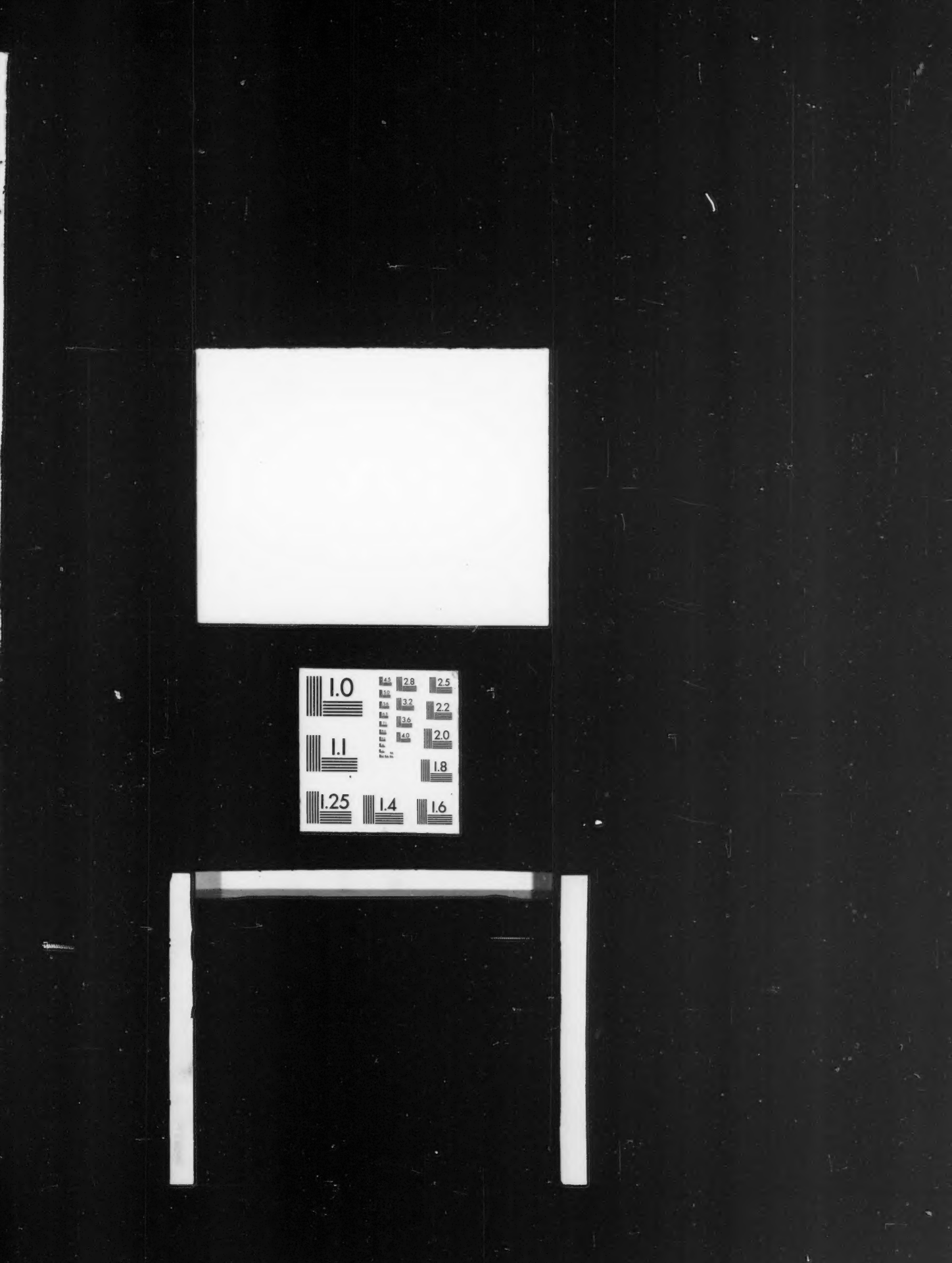


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